APPLIED RESEARCH BRANCH

Strategic Policy

Working Paper

Human Resources Development Canada
Développement des ressources humaines Canada
Canada

101-04289/

Applied Research Branch
Strategic Policy
Human Resources Development Canada

Direction générale de la recherche appliquée
Politique stratégique
Développement des ressources humaines Canada

Immigrant Occupational Skill Outcomes and the Role of Region-of-Origin-Specific Human Capital

W-00-8E

by
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September 2000

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Printed/Imprimé 2001
ISBN: 0-662-29577-3
Cat. No./N° de cat. MP32-28/00-8E

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Abstract

Growing evidence suggests that there is a substantial underutilization of immigrant skills – the commonly-referred-to "taxi driver" phenomenon of recent immigrants to Canada. Are immigrants who were highly skilled doctors and engineers in their source country having to resort to low-skilled occupations upon arrival in Canada? This paper combines data from the 1991 and 1996 Canadian censuses to evaluate the importance of this phenomenon by comparing occupational skill distributions found among immigrants from different regions of origin (including native-born residents as a reference group). A logistic regression model that asks the question "What is the probability of an immigrant (with certain characteristics) finding employment in a high-skilled occupation?" helps to isolate human capital endowments that contribute to certain occupational skill distributions found among immigrants.

Level of education, major field of study, and knowledge of official languages are key determinants of finding high-skilled employment. Region-of-origin and interaction effects between education and region of origin are found to have a strong influence on the likelihood of being employed in high-skilled work. The immigrant-specific variable identifying period of immigration is also found to influence occupational skill outcomes, particularly for more recent cohorts. This study highlights the importance of region-of-origin effects in the development of policy efforts to more accurately utilize the human capital of immigrants in the Canadian labour market.

Résumé

De plus en plus, les résultats de recherche suggèrent une sous-utilisation grave des compétences des immigrants – ce que l'on appelle communément le phénomène du « chauffeur de taxi » et que l'on retrouve chez les immigrants récents au Canada. Les immigrants qui dans leur pays d'origine étaient des docteurs et des ingénieurs hautement compétents n'ont-ils d'autre choix que d'accepter un emploi peu spécialisé lorsqu'ils arrivent au Canada? À partir des données des recensements de 1991 et 1996, l'article évalue l'importance du phénomène en comparant les compétences d'immigrants provenant de différentes régions (l'étude inclut un groupe de référence formé de personnes nées au pays). Un modèle de régression logistique où l'on pose la question « Quelle est la probabilité qu'un immigrant (possédant certaines caractéristiques) trouve un emploi dans une profession hautement spécialisée? » permet d'isoler les éléments du potentiel humain qui contribuent à la distribution de certaines compétences professionnelles chez les immigrants.

Le niveau d'études, le principal domaine d'études et la connaissance des langues officielles jouent un rôle déterminant lorsqu'il s'agit de trouver un emploi. La région d'origine ainsi que les effets de l'interaction entre le niveau d'études et la région d'origine influent fortement sur la probabilité de trouver un emploi hautement spécialisé. On a également déterminé que la variable, spécifique à l'immigrant, qui précise la période d'immigration influe sur la probabilité de trouver un emploi hautement spécialisé, tout particulièrement dans le cas des cohortes les plus récentes. Cette étude souligne l'importance de l'effet de la région d'origine dans l'élaboration de mesures stratégiques visant à utiliser de façon plus juste le capital humain des immigrants dans le contexte du marché du travail canadien.

Acknowledgements

The author would like to thank Don DeVoretz and Krishna Pendakur for their technical advice and support. The author also wishes to thank Jorge Aceytuno and Louis Grignon for helpful comments.

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1. Introduction

Growing evidence suggests there is a substantial underutilization of immigrant skills – the "taxi driver" phenomenon of recent immigrants to Canada.[1] Immigrants who were skilled doctors and engineers in their country of origin are suspected of having to resort to low-skilled occupations upon arrival in Canada. This paper aims to identify this phenomenon in the data as well as decipher factors contributing to this underutilization of human capital. The heterogeneity of immigrants to Canada, who come from many different regions of origin, makes this a difficult task. Education and experience may be assessed differently among immigrants, depending on region of origin, and lead to different probabilities of getting into a high skilled occupation. The underutilization of immigrant human capital is measured by differences in occupational skill level attainment compared to native-born residents, controlling for influential factors such as education and region of origin. As national wealth increasingly relies on the skills of a country's workforce, there is need to evaluate whether Canada is using the human capital of immigrants efficiently. Equity issues also arise if immigrants are unable to find skilled employment.

The extent to which immigrants find employment appropriate to their education and experience is most often explained within the context of two different theories. First, foreign education may be of lower quality than education obtained in Canada. In this case, the title of a degree of an educational program would be the same, but the worth may be less for foreign earned degrees. Second, because Canadian employers are risk averse and have imperfect knowledge of foreign credentials, full compensation is not given to foreign credentials, which results in the underutilization of human capital. The empirical work developed here cannot distinguish between these explanations for unequal occupational skill outcomes of native-born residents and immigrants. Instead, this study identifies where occupational skill differentials are most acute and makes suggestions on how the outcomes of immigrants can be improved.

This paper highlights the extent to which immigrants integrate into the Canadian skilled workforce as measured by the results of a logistic regression model that enables the identification of factors that contribute to finding high skilled occupations. The economic experience of immigrants to

[1] For example, Goldberg, 2000.

Canada is viewed through occupational skill outcome variations among immigrants and native-born residents. The importance of immigration to the Canadian economy is stressed in Part I. Previous work concerning immigrant progress in Canada's labour environment is also reviewed in this section. In Part II, a logistic regression model is outlined that delivers the probability of both immigrants and native-born residents finding high skill level employment in the Canadian labour market. The variables and the data source are explained in this section. In Part III, the 1991 and 1996 census data allow a descriptive analysis that reveals immigrants and native-born residents find themselves differently distributed among occupational skill levels. Part IV evaluates findings of the model, which is estimated separately for males and females. Part V summarizes key results as well as indicates importance of the findings and avenues for further research. The goal of this study is to identify forces that determine occupational skill outcomes of immigrants. Canadian immigration policy is currently under review and studies such as the present can contribute to the formation of policy that facilitates the integration of immigrants into the labour market.

1.1 An Overview of Immigration in Canada

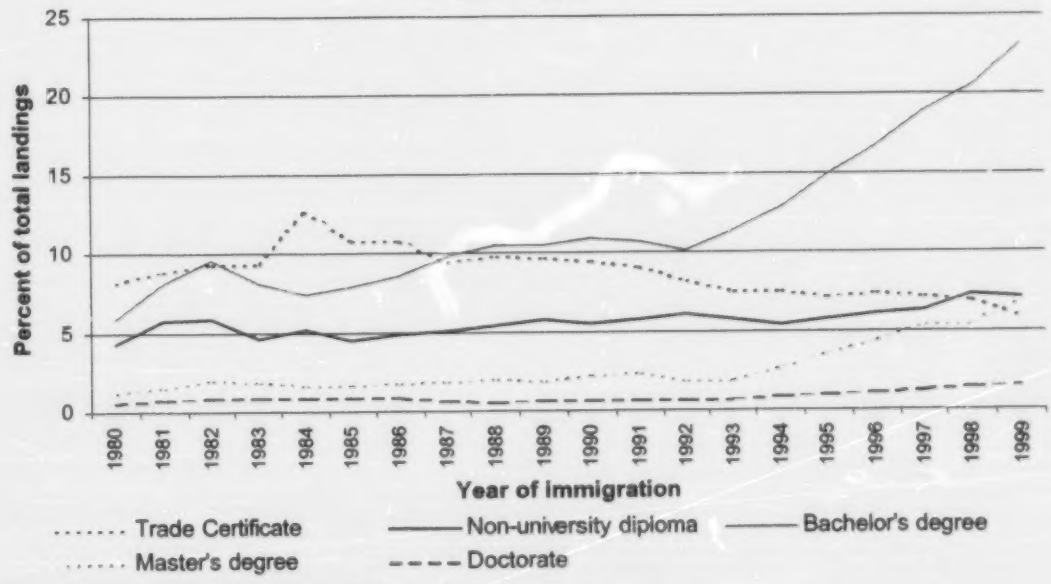
Immigrants who came to Canada in the early 1990s have not performed as well as previous arrivals in terms of earnings and rates of employment. Immigrants landing in the early 1990s experience significantly lower initial earnings than that of previous cohorts of immigrants.[2] Recent immigrants also have lower rates of employment than those of comparable native-born residents and these rates have declined markedly between 1986 and 1996. For example, Badets and Howatson-Leo (1999) find that the employment rate of recent immigrant men (having landed within the past five years) aged 25 to 44 years was 81 percent in 1986 and 71 percent in 1996, a decline of 10 percentage points over the decade. During this period, the employment rate of native-born men declined only 3 percentage points, from 87 percent in 1986 to 84 percent in 1996. The study also finds that recent immigrant women had an employment rate of 58 percent in 1986 and 51 percent in 1996, a decline of 7 percentage points, while for native-born women, the employment rate actually rose 8 percentage points, from 65 percent in 1986 to 73 percent in 1996. While employment rates declined for both male and female recent immigrants, native-born

[2] For example, according to tax file data [Longitudinal Immigration Data Base (IMDB)], two years after landing, immigrants arriving in 1980 earned an average annual amount of $21,300 (in 1995 dollars) compared to the annual $16,500 (in 1995 dollars) earned after two years by immigrants landing in 1990.

men experienced a much smaller decline while native-born women experienced an increase in their employment rate. Employment and earnings information (such as that contained in the Longitudinal Immigration Data Base (IMDB) and the 1996 Census) indicate that immigrants landing in the early 1990s have experienced greater difficulties integrating into the Canadian labour market than have earlier arrivals.

These outcomes occurred in spite of the fact that recent immigrants are more highly educated than were previous cohorts of immigrants. The rising trend overtime in immigrant education levels is evident in Figure 1.

Figure 1 **Post-secondary education by immigrant landing year: 1980-1999**

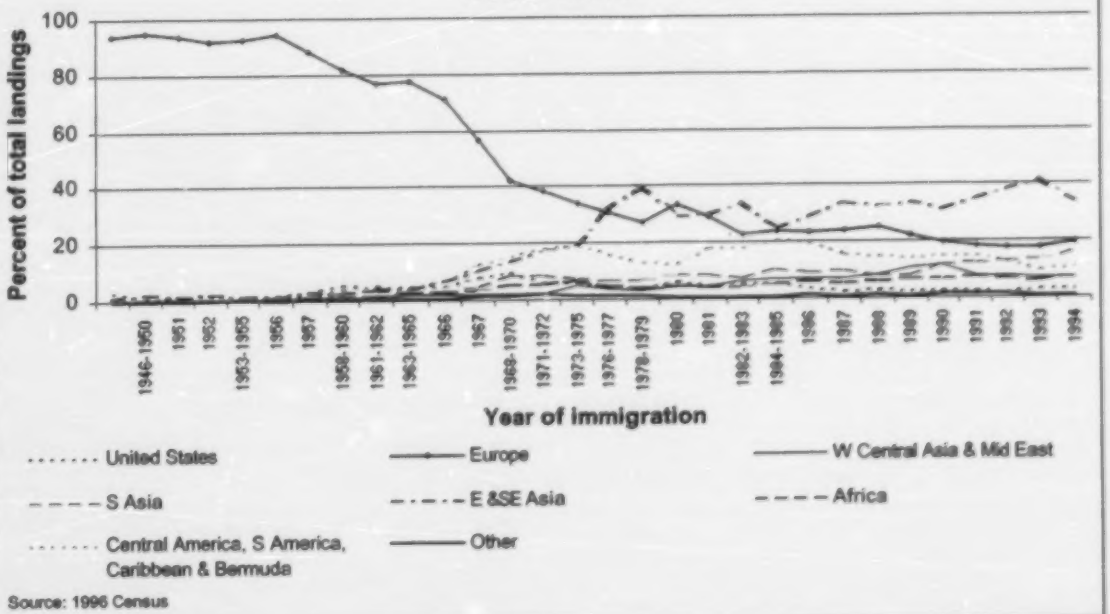


Source: Citizenship and Immigration Canada, 2000

A substantial increase in the proportion of immigrants landing with university-level education is evident during the 1990s. As Figure 1 above shows, 45 percent of immigrants landing in 1999 had post-secondary education, compared with 20 percent in 1980 and 29 percent in 1990. In 1999, 23 percent of immigrants landing had completed a Bachelor's degree, 7 percent a Master's degree, and 2 percent an earned doctorate. The trend of increasingly higher educated immigrants landing in Canada is significant in light of their recent performance in the labour market.

A drastic change in composition of Canadian immigrant origins has occurred over time. In the immediate postwar decade, Canada's immigration policy had a specific preference for immigrants from Northern European countries.[3] Over the 1950s and 1960s, equal entry conditions were gradually extended to immigrants from all regions. During the 1970s and 1980s, large increases in the proportion of immigrants from Eastern Europe, Asia, Latin America, and Africa occurred. As more immigrants come from non-traditional areas, they may possess education and other human capital less readily recognized in – or transferable to – the Canadian labour market.

Figure 2 **Region of origin by year of immigration: 1946-1996**



Source: 1996 Census

The profile of recent imm igrant cohorts has changed dramatically over the past few decades and is seen in Figure 2 above. Europeans comprised over 90 percent of all immigrants to Canada prior to 1960. European-born immigrants represented only one in five immigrants landing in 1996 compared to 57 percent in 1970. Moreover, the proportion coming from Western Europe has declined to 10 percent in 1996 from 51 percent in 1970. In contrast, the proportion of landed immigrants from Asia and the Middle East was 57 percent in 1996 as compared to 18 percent in

[3] Baker and Benjamin, 1994.

1970. The percent of total immigration from Central America, South America, Caribbean, and Bermuda rises after 1960, as does immigration from Africa. Distinct change in the composition of immigrant origins occurs after 1960 due largely to changes in Canadian immigration policy and changing conditions in source countries.[4]

Under Canada's most recent *Immigration Act* (enacted in 1978), immigration policy has been conducted to correspond with a point system that attempts to match skills of immigrants with perceived needs of the Canadian labour market.[5] One major barrier faced by many immigrants is a lack of recognition of foreign credentials, made worse because of a difficulty for immigrants to obtain information and have qualifications assessed before coming to Canada.[6] The accreditation of immigrant professionals is of growing concern to Canada, as evidenced at a recent conference in October 1999 in Toronto. This conference featured keynote addresses by provincial and federal politicians, including both the Minister of Citizenship and Immigration and the Minister of Human Resources Development Canada, and drew participants from many interested parties. The conference was organized in order to address the belief that the skills of recent immigrants selected under the current points system are dramatically underutilized, which is a great loss to Canada's economy and productivity, and that the current qualification recognition system is in need of serious changes.[7] Experts voiced that it is currently filled with discriminatory practices, including lack of recognition of language barriers, higher costs for foreign-trained individuals to prove their accreditation, and a higher level of intervention by regulatory bodies for immigrants than for native-born professionals.[8,9]

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[4] Change in policy allows for immigrants from all countries to apply, but change in composition depends on a combination of push and pull factors in source countries and Canada.

[5] Baker and Benjamin, op. cit.

[6] Canada, Department of Citizenship and Immigration, 1998a.

[7] Canada, Human Resources Development Canada, Department of Citizenship and Immigration, 1999.

[8] Ibid.

[9] Canadian Press, December 20, 1999. The provincial Human Rights Commission of British Columbia ruled in late 1999 that British Columbia's College of Physicians and Surgeons discriminated against five foreign-trained physicians by denying them the right to work as doctors. The commission ordered the college to negotiate a resolution with the doctors, one of whom had been trying to practice in British Columbia since 1983. The five doctors came to British Columbia from Italy, Romania, Russia, India and the Philippines. All five passed an equivalence examination before entering Canada, allowing them to apply for the mandatory internship program that places graduating students in hospitals. The doctors, all Canadian citizens or landed immigrants, also passed the Medical Council of Canada evaluating examination, a requirement of all foreign graduates from medical

The direction of new immigration policy is a selection model for immigrants based on generic attributes for success in a dynamic labour market rather than specific occupations. Proposed policy alterations stem from a perceived need for immigrants with flexible skill sets, and a realization of the importance of temporary economic movement.[10] A focus on transferable skill sets creates a necessity to examine differences between the labour market experiences of this newer immigrant group with those of the previously dominant European group of immigrants. Previous studies treat immigrants to Canada as a largely homogeneous group, leaving a gap in knowledge of differences among occupational skill outcomes – outcomes that contain increasingly relevant information regarding the ability of immigrants to integrate into the labour market. With the current policy direction towards the selection of immigrants based on flexible skill sets, it is necessary to ensure abilities are adequately realized in the Canadian labour market.[11]

1.2 Literature Review

Previous studies on immigrants to Canada focus on wages and earnings, education, and occupation. Baker and Benjamin (1994) study the performance of immigrants in the Canadian labour market using the 1971, 1981, and 1986 censuses to find that economic integration is becoming an increasingly elusive goal for most immigrant cohorts. The study finds that foreign educated immigrants earn less than do native-born residents with the same level of education. Further, a decrease in the entry earnings of recent immigrants is indicative of *permanent* differences across arrival cohorts, whose identification is "an important topic for future research." The authors also find that the earlier immigrants have earnings that equal or exceed those of native-born residents. This evidence suggests that the labour market experience of recent immigrants has changed markedly from that of previous arrivals.

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schools not recognized by the British Columbia college. The commission found that foreign trained doctors from New Zealand, South Africa, Australia, England, and the United States, were allowed to bypass the internship requirement and practice medicine immediately after taking the evaluating exam. Other doctors, such as the five in the case, were not granted internships, although some applied year after year, and were effectively barred from practicing medicine.

[10] Canada, Department of Citizenship and Immigration, 1998a.

[11] Any discussion on selection is limited to dependent immigrants, as immigration policy is made along the lines of economic, family, and refugee class. Family and refugees are not selected, whereas economic (independent) immigrants are selected.

McDonald and Worswick (1998) use cross-sectional surveys spanning the period 1981 to 1992 for earnings comparison of immigrant and native-born men in Canada. The study finds that recent immigrant cohorts have suffered no decline in earnings. Job tenure is found to be a strongly significant determinant of earnings, and previous estimates of immigrant earnings differentials that have not incorporated job tenure information may partly reflect differences in tenure between immigrants and native-born residents. The authors contend that the decline in the rate of immigrant assimilation is not due to a decrease in the quality of immigrants. Instead, it is argued that economy wide conditions, specifically during year of arrival, affect the long-term performance of immigrant groups.

Studies that focus on the wages and earnings of immigrants generally treat immigrants as a homogeneous group. An exception to this is Pendakur and Pendakur (1998) who examine earnings differentials between whites and visible minorities, and earnings differentials within the white and visible minority groupings. Immigrant white men and immigrant visible minority men face earnings gaps of 2 percent and 16 percent, respectively. Earnings penalties range from 1 percent for Chinese immigrants to 22 percent for Black immigrants. A large and statistically significant earnings difference exists between immigrants who completed their education in Canada and immigrants who completed their education abroad, although the authors find that immigrant earnings gaps remain even after place of education is taken into account.

Other studies look at educational differences among immigrants and native-born residents. Badets and Howatson-Leo (1999) find that most recent immigrants speak English or French and are highly educated. The proportion of men with university degrees is twice as high among recent immigrants (36 percent) as among native-born men (18 percent) while for recent immigrant women the numbers are 31 percent versus 20 percent. However, despite these language abilities and high qualifications, recent immigrants are less likely to be employed. At the university level, 92 percent of native-born residents have jobs compared to 73 percent of recent immigrants and one quarter of recent immigrants with a university degree hold a job in sales and service occupations. As new entrants to the labour market, immigrants who came to Canada during the 1990s experienced difficulties finding employment.

Pendakur and Mata (1999) look at change over time in industry propensities of immigrant and native-born workers who live in the three largest Census Metropolitan Areas (CMAs) in Canada. The authors find labour force integration changes substantially both in response to shifts in the labour market and to the social integration of immigrants. Native-born workers slowly move away from areas considered dying sectors over the twenty-year period studied (1971 to 1991), as the economy shifts toward one based on services rather than manufacturing. Immigrants with low levels of schooling replace the native-born residents in these jobs. Substantial moves toward self-employment takes place on the part of immigrants working in high education industries, providing evidence in support of theories pointing to blocked occupational mobility.

Green (1995) examines occupational distributions of immigrants, particularly in comparison with their stated intended occupations at time of landing. The study estimates a multinomial logistic regression model of occupational selection for male immigrants using data from the 1981 and 1986 censuses. The model results indicate a statistically significant relationship between intended occupation at time of entry and actual occupation. However, once other occupation-related personal characteristics, such as education, are included, the significance of the intended occupation variables is eliminated. The author argues that this finding implies that characteristics such as education and location are more important determinants of occupation than statements of intent at time of landing.

Wanner (2000) examines trends in the occupational attainment of male immigrants to Canada over the period 1971 to 1991, with a focus on ethnicity. The study finds that not only is the effect of ethnicity on occupational attainment limited largely to immigrants educated abroad, but within this group there is no evidence that the strength of the effect is declining over time. The study also finds that regardless of their age, Asian-Canadians immigrating before 1971, employed by others, and educated in Canada are roughly one-fifth as likely to be employed in the corporate sector compared to the low-wage sector. The only other Canadian-educated group for which place of birth is a factor in occupational attainment is middle-aged Southern Europeans, who still have a considerably higher likelihood of attaining a corporate sector position than do Asian-Canadians. Wanner asserts that the main policy implications of the study rest on the finding that it is mainly

those educated abroad whose opportunities in the labour market are below those of the native-born.

A review of recent studies on immigrants in the Canadian labour market reveals a gap in the knowledge of occupational skill level attainment by region of origin. Literature confirms the existence of difficulties faced by recent immigrant cohorts, but which may be caused by differing factors. Previous studies generally treat immigrant education and experience uniformly, a practice that misses a main feature in immigrant labour market integration – the transferability of the skills immigrants obtain outside of Canada. This paper examines the transferability of foreign human capital, by region of origin, to the Canadian labour market.

2. Conceptual Framework

Structures within the Canadian economy may be preventing the utilization of human capital developed outside Canada. For example, there is concern among labour market skill experts that many highly trained professionals and technically skilled immigrants, who have been welcomed to Canada, find provincially legislated licensing bodies slow or reluctant to recognize their credentials.[12] Experts believe this reluctance – which varies among professions and provinces – often can not be justified on the basis of protecting standards, and amounts to a restriction of the supply of skills and a waste of human potential.[13] The objective of this study is to identify which immigrants with what human capital endowments are most likely to find high skilled employment in the Canadian job market, and which groups experience acute gaps between human capital endowment and occupational skill outcomes.

Does knowing an immigrant's region of origin provide useful information for predicting his or her occupational skill outcome in Canada, and if so, what is the relationship between these two factors? Although many factors could affect an immigrant's occupational outcome, what is most useful for modelling purposes is relevant and readily available information, such as region of origin. The literature argues that some immigrant groups tend to experience labour market difficulties for a variety of reasons, including discrimination, non-recognition of foreign credentials, and low adaptability to Canadian technology.[14] If this is true, it should be reflected in the coefficients of some of the region of origin variables included in the regression.[15] Any additional information showing that immigrants are not a homogeneous group allows, if necessary, the design of policy tools that target specific and broad groups.

2.1 Model

Analysis builds upon a logistic regression model that estimates occupational skill level by asking the question: *What is the probability of an immigrant (with certain characteristics) finding*

12 Advisory Council on Science and Technology, 2000.

13 Ibid.

14 de Silva, 1997b.

15 Ibid.

employment in a highly skilled occupation? Four different levels, (I, II, III, and IV), with skill level IV referring to the highest skilled occupations are used based on Standard Occupational Classification (SOC) (1991) classification. In order to capture the probability of outcomes, two logistic models are estimated. A first logistic regression estimates the probability of an immigrant to be employed in the highest skilled work, level IV. A second logistic model pools skill levels III and IV together and identifies the probability of finding skilled employment.[16] The logistic regressions are run separately by gender because occupational skill outcomes may differ among native-born and immigrant males and females.

Human capital variables are the focus of this study – particularly the significance of education interacted with country of origin. With βx representing the right hand side variables, the functional form of the logistic regression model is:

$$L = \frac{e^{\beta x}}{1 + e^{\beta x}}$$

where the dependent L variable equals 1 if the individual is employed in skill level IV work, and 0 otherwise. The model can be transformed to the following equation:

$$Y = \beta X + u$$

where $Y = ln\left(\frac{P}{1-P}\right)$ is the logistic, $P = \Pr\{L = 1 | X\}$, X is a vector of independent variables, and β is the vector of associated coefficients.[17] The following variables comprise the right hand side variables.

- Year of census (1991 or 1996)
- Age,[18] Age squared
- Years since migration, Years since migration squared
- Period of immigration
- Census Metropolitan Area (CMA)

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16 A weakness of logistic regression models is a tendency to be good at predicting the dominant state. If the dominant form is that immigrants do not work in skill level IV jobs, the logistic may be poor at prediction. As a response to this, the second logistic is run with grouped skill level III and IV as the dependent variable, as together these two skill levels account for over 50 percent of outcomes in most region of origin categories, producing estimates that are good for prediction.

17 In the second logistic regression, the dependant variable is pooled skill level III and IV occupations.

18 For the present analysis, age is used as a proxy for work experience.

- Legal marital status
- Member of visible minority
- Place of birth (region of origin)
- Highest level of education
- Highest level of education/Place of birth (region of origin)
- Major field of study
- Knowledge of official languages

Within the model, the significance of human capital variables indicates the extent by which skills are rewarded. Education variables are interacted with region of origin to see how this endowment affects the probability of finding a job in a high skilled occupation. Classification according to place of birth is by geographical region and is as follows. [See Appendix A: Region-of-Origin Geographical Classification.]

- Native-born
- North America
- Northern Europe
- Western Europe
- Southern Europe
- Eastern Europe
- Other Europe
- West Central Asia & the Middle East
- Southern Asia
- East and South-East Asia
- Africa
- Central/ South America/ Caribbean & Bermuda
- Other

An advantage of the logistic regression approach is that skill level is looked at as the dependent variable in a regression equation. Characteristics of an immigrant are used to estimate the probability that he or she will obtain a high skill level occupation. Human capital endowments that positively influence the probability of an immigrant obtaining employment in a high skilled occupation are identifiable. Many advantages of logistic models make it an ideal way to compare occupational skill outcomes of immigrants and native-born residents.

2.2 Data

Data are drawn from the 1991 and 1996 Canadian Census Public Use Micro Data, Individual Files, that represent a 3 percent sample of the Canadian population. The dependent variable used in this paper is "high skill occupation" as per the Standard Occupational Classification (SOC) (1991). The Census is the most used database in regard to research on immigrants. These data sets contain a large sample size and the coding is similar across these years. A broad breakdown in countries of immigrant origin is available. Two data sets were created for the empirical work, one comprised of all male individuals and one of all females individuals, aged 25 through 59 living in provinces outside the Atlantic region.[19] The immigrant sample is further restricted to those landing after age 25, making it possible to assume education was obtained outside of Canada.[20] By truncating the sample, the distribution of people is affected.[21] Immigrants landing before age 25 must not be counted because they most often acquire human capital within Canada before entering the labour force. This population has been censored because the population parameters of this group are fundamentally different and non-random from those people immigrating after age 24 and it is necessary in this study that these two groups not be mixed. In taking this sample selection, 9.2 percent of the observations are thrown out.[22] Observations with missing data are excluded from the sample.

2.3 Assimilation and Cohort Effects

Two separate sources give rise to changes in immigrant labour market behavior, *assimilation effects* and *cohort effects*. Assimilation effects occur over time according to length of residence and can be characterized as the immigrant's eventual convergence (or continual divergence) of employment and unemployment experience to the labour market behavior of native-born

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19 Residents of Nova Scotia, New Brunswick, Prince Edward Island and Newfoundland are excluded from the analysis because detailed immigrant variables are masked.

20 Since education generally is completed by the mid-twenties, it is assumed that most, if not all, of those immigrating at age 25 or later have received their degrees outside of Canada.

21 For example, a result of the sample being restricted to immigrants arriving after age 24, is that for the cohort arriving in 1985, the 1996 census will not have foreign-born people who are 35 years or less.

22 The method of using only immigrant observations for those arriving in Canada after age 24 gives a total sample size of 693,159. If all immigrants are included in the sample, the number of observations is 763,311, giving a difference of 70,152 observations, or 9.2 percent of 763,311.

residents. Cohort effects arise from differences in the labour market attributes of immigrants arriving in different years. It is not possible to distinguish between a poor labour market environment and the attributes of the immigrant cohort – the demand and supply effects can not be isolated. Some immigrant attributes are observed (i.e. language and education) while others are unobserved (i.e. motivation and transfer of human capital). This can be affected by changes in the job skill standards applied to immigrants in any given year, resulting in an inflow of immigrants with differing abilities and potential economic success. It is significant that recent immigrant cohorts could differ from their predecessors in the levels of observable skills they bring to Canada.

Controlling for assimilation and cohort effects requires examining the same immigrant cohort at different times, using data for both immigrants and native-born residents. To put multiple censuses together, the 1991 and 1996 cross-sections are merged to generate a single data file. Variables are created that give the year of census (i.e. 1991 or 1996) and the age of an individual. These age and period effects are assumed to be the same for both native-born residents and immigrants. The estimated logistic regression includes *years since migration* and *period of immigration* variables that allows both assimilation and cohort affects for immigrant groups to be identified. Dummy variables indicating the period in which immigration occurred give coefficient estimates that represent the cohort-specific "fixed effects" and measures the extent of differences in participation in high skill employment as of the time of entry across successive immigrant arrival groups. Years spent in Canada give assimilation effects for immigrants. While the same individuals cannot be identified across the two census years, different individuals with the same number of years since immigration can be identified as coming from different period of immigration cohorts (the years since migration variable is not a linear combination of the period of immigration cohort dummies). This method, which follows Bloom, Grenier, and Gunderson (1994), allows estimation of assimilation effects (within cohort occupational skill-level growth) as well as period of immigration cohort effects (cross-cohort occupational skill-level growth).

3. Descriptive Analysis

To establish that disparities exist among occupational skill level distributions held by immigrant groups and native-born residents, the analysis examines evidence provided by the data for both males and females. Native-born residents are included in the analysis as a reference group. Data statistics are also used to inform about the representative nature of the sample in relation to the Canadian population. The following tables are averages of the 1991 and 1996 census data sets.[23]

In Table 1, the two data sets created from the 1991 and 1996 censuses and split by gender are divided into the designated regions of origin included in the model, providing the count of individuals born in each area.[24] The total number of individual observations for the male data set is 163,139, and for the female data set it is 166,305, with native-born residents comprising 85.3 percent of each sample. The table reveals the largest group of immigrants to Canada (landing at 25 years of age or over and aged 25 through 59) come from East and South-East Asia and comprise 4 percent of the total male sample and 4.4 percent of the female sample. This immigrant group is followed in size by those originating from Eastern Europe, representing 1.9 percent of the male sample and 1.7 percent of the female sample.

The mean average age among native-born residents and within immigrant populations is contained within Table 1 and is an important factor when interpreting cross-tables that do not control for influential factors. With an average age of 39 years, the youngest immigrant group for both males and females is from West Central Asia and the Middle East. The immigrant group eldest on average is from Northern Europe and has a mean age of 47 years. Immigrant groups from Southern and Western Europe are also relatively older. Females are on average younger than males within each region of origin group. The mean age within an immigrant group is indicative of employment tenure, as well as time and experience in the Canadian labour market.

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[23] Using arithmetic means of two stocks of data without providing measures of variance or standard deviations can be misleading. A cross-check indicates that this is not the case. Individual data sets are available upon request.

[24] This analysis is based on a 50 percent random sample of the created data set.

Table 1 **Sample Statistics: Native-born Residents and Immigrants, 1991 & 1996 Census**

	Women			Men		
Place of birth	*Total individuals*	*Average age**	*Average years in school***	*Total individuals*	*Average age**	*Average years in school***
Native-born	141,797	39.60	13.86	139,203	39.59	13.88
North America	1,270	42.23	16.58	932	43.40	17.23
Northern Europe	2,396	46.98	15.28	2,433	47.27	16.34
Western Europe	1,190	45.55	12.39	1,204	46.16	12.73
Southern Europe	2,062	46.33	11.32	2,451	45.65	12.33
Eastern Europe	2,890	43.78	15.01	3,067	44.60	15.39
Other Europe	1,648	42.21	14.28	1,904	42.03	15.27
W Central Asia & Middle East	1,175	39.08	14.91	1,138	39.56	15.73
Southern Asia	2,324	41.62	14.37	2,046	42.28	14.84
E & SE Asia	7,304	41.00	13.87	6,500	41.26	14.86
Africa	584	40.97	13.79	781	41.64	15.22
CA SA Caribbean & Bermuda	1,561	42.92	12.54	1,366	43.25	12.99
Other	104	42.66	12.80	114	43.90	13.55
Total	166,305	–	–	163,139	–	–

* Calculated mean average age in the range 25 to 59 years.
** This is an average based on the grouping of years of schooling used in the census.

The sample data indicates skill level differences in the occupations held among native-born residents and various immigrant groups. Table 2 below allows comparison of native-born residents and immigrants by place of birth and occupational skill level, again divided by gender. (For a breakdown of skill level into occupation, see Tables 1B and 2B in Appendix B.)

Table 2 **Place of Birth by Occupational Skill Level [SOC (1991)]: Percent Total Sample by Region of Origin, 1991 & 1996 Census**

Men

Place of birth	*Skill level*				
	Not applicable*	I	II	III	IV
Native-born	7.06	9.08	26.82	32.24	24.81
North America	3.86	4.08	15.13	20.49	56.44
Northern Europe	3.74	5.10	15.37	33.62	42.17
Western Europe	6.31	20.18	20.35	34.39	18.77
Southern Europe	13.02	15.75	20.69	33.46	17.10
Eastern Europe	7.79	10.73	22.27	34.85	24.36
Other Europe	7.93	11.71	25.95	25.84	28.57
W Central Asia & Middle East	17.22	6.33	19.60	22.50	34.36
Southern Asia	11.44	12.95	29.86	22.19	23.56
E & SE Asia	11.85	12.54	26.78	23.71	25.12
Africa	19.72	7.81	21.90	17.03	33.55
CA SA Caribbean & Bermuda	12.59	14.49	33.02	25.11	14.79
Other	7.02	11.40	21.93	35.09	24.56

Women

Place of birth	*Skill level*				
	Not applicable*	I	II	III	IV
Native-born	20.24	7.49	30.43	21.47	20.37
North America	20.16	4.09	20.16	18.43	37.17
Northern Europe	16.65	5.97	31.22	23.33	22.83
Western Europe	25.63	17.23	31.43	16.13	9.58
Southern Europe	41.03	13.82	25.22	12.56	7.37
Eastern Europe	25.92	13.60	28.41	16.85	15.22
Other Europe	24.88	15.05	30.70	15.11	14.26
W Central Asia & Middle East	35.91	7.06	24.09	15.57	17.36
Southern Asia	24.61	13.94	35.71	12.87	12.87
E & SE Asia	25.53	12.13	34.62	14.50	13.21
Africa	36.99	8.90	26.71	12.67	14.73
CA SA Caribbean & Bermuda	30.24	16.34	31.97	11.98	9.48
Other	25.96	14.42	21.15	17.31	21.15

* It is necessary to include observations where occupation is not applicable in the sample, as this may result from lack of being in the labour force due to non recognition of foreign credentials or skill underutilization. Excluding these observations would bias the model.

As shown in Table 2, 24.8 percent of native-born males and 20.4 percent of native-born females are employed in skill level IV occupations. Male immigrants with the highest relative representation employed in this skill level are from North America, with 56.4 percent landing after age 24 finding such work, followed by those from Northern Europe, at 42.2 percent. Male immigrants from Africa (33.6 percent), West Central Asia and the Middle East (34.4 percent), Other Europe (28.6 percent), and East and South-East Asia (25.1 percent) have greater representation in skill level IV employment than do native-born residents. At 14.8 percent, male immigrants from Central America, South America, Caribbean and Bermuda have the lowest relative participation in skill level IV work, followed closely by Southern European (17.1 percent) and Western European (18.8 percent) immigrants. South Asian and Eastern European male immigrants have similar high skill occupational involvement as do native-born males.

Immigrant and native-born females have higher representation in the not applicable occupational category relative to the male sample, a reflection of lower employment rates for females in general. Female representation in skill level IV employment is lower for every region of origin group, including the native–born, relative to their male counterparts. Female immigrants with high representation in high skill employment relative to native-born women originate from North America and Northern Europe, with 37.2 percent and 22.8 percent respectively, landing after age 24 finding such work. At 7.4 percent, female immigrants from Southern Europe have the lowest relative representation in high skill occupations, followed by those from Central America, South America, Caribbean and Bermuda (9.5 percent) and Western Europe (9.6 percent). All other female immigrant groups have lower representation in skill level IV occupations relative to native-born females, with the exception of immigrants from other.[25]

As both categories comprise skilled work, occupations in skill level III and IV are next pooled together. Men employed in skill level III and IV represent 57.1 percent of the native born sample. North American male immigrants remain strongly represented in skilled occupations at 76.9 percent, followed by Northern European male immigrants with 75.8 percent participation. When the two skilled occupation levels are combined, representation by West Central Asian and Middle

[25] A small sample size of immigrants from "other" makes it difficult to draw strong comparisons.

Eastern male immigrants (56.9 percent) drops to below that of native-born males, as does that by those from Africa (50.6 percent). When the two skill levels are pooled, male immigrant representation from Eastern Europe is 59.2 percent and is now relatively higher than that of native-born males. Remaining immigrant categories display lower levels of representation than native-born residents in the two skilled occupation levels, particularly those from Central America, South America, Caribbean and Bermuda, with 39.9 percent involved. According to census data, some immigrant male groups arriving in Canada as adults find work in skilled occupations to a lesser extent than do native-born residents and immigrants from other regions.

When female groups are compared without controlling for influential factors, most immigrant groups have low representation in terms of being employed in skill level III and IV occupations when compared to native-born. Females in skill level III and IV represent 41.8 percent of the total native-born sample. North American female immigrants remain strongly represented in high skill occupations at 55.6 percent, followed by Northern European female immigrants with 46.2 percent participation. When the two skill levels are pooled, immigrant females from Southern Europe remain the group with the lowest relative representation, at 19.9 percent. All remaining female immigrant groups display lower representation in skill level III and IV occupations compared to native-born women. According to census data, the majority of female immigrant groups arriving in Canada as adults find work in skilled occupations to a lesser extent than do native-born female residents.

Descriptive analysis reveals that information regarding individual count, average age, and average years in school is representative of the larger Census population for groups of individuals by region of origin in the sample. An exploration of the sample taken from census data further highlights important differences among immigrants and native-born residents of both genders with regards to occupational skill level. This alone is not to be taken as evidence that there is underutilization of human capital amongst immigrant groups. There is a need to explore the data with a formal model that estimates the relative likelihood of an immigrant attaining high skilled employment while controlling for influential factors.

4. Regression Estimates

Using the 1991 and 1996 census data, coefficients are estimated for each logistic regression that allow the computation of the probability of being in high skill employment, holding all other factors at their average value.[26] This technique isolates each variable in the model and reveals its direct relationship with the probability of employment in high skill work. To assess statistical significance of the estimates, a 95 percent degree of confidence is used. In the context of the logistic regression, statistical significance means that a coefficient in the regression is statistically different from the coefficient of the omitted variable.[27]

The regression results presented in Tables 3B, 4B, 5B, and 6B in Appendix B provide calculations of the likelihood for men and women to be employed in a high skill occupation derived from the logistic regression analysis. The levels of the rates are calculated holding other characteristics constant at the value of the mean for each factor. For example, employment in skill IV work for a male visible minority is interpreted as the population of male visible minorities working in high skill employment, who: would be of average age in the population, have an average level of education, have arrived during an average period of immigration, be from an average region of origin (a hybrid male who would be 85.3 percent native-born, 0.6 percent North American, 1.5 percent Northern European, 0.7 percent Western European, 1.5 percent Southern European, 1.9 percent Eastern European, 1.2 percent Other European, 0.7 percent West Central Asian and Middle Eastern, 1.3 percent South Asian, 4 percent East and South-East Asian, 0.5 percent African, 0.8 percent Central and South American, Caribbean and Bermudan, and 0.1 percent Other), and so forth. This method used to interpret logistic regression models allows comparison of relative levels within the decomposition of each factor, knowing that all other factors are held constant. For example, native-born resident's and immigrant's participation in high skill employment can be compared knowing that they are compared having

[26] The results presented in this section are based on a 50 percent random sample of the created data set.

[27] When an estimate does not test as significant, it can mean either that the variance of the estimate is large and the possibility cannot be excluded that the estimate is not different from the base category, or that the estimate is actually very similar to the base category.

the same age, education, field of study, etc. The logistic regression technique allows for separate returns to post-secondary education by region of origin.

Conclusions from the analysis in Tables 3B and 5B in Appendix B, the probability of finding work in skill level IV occupations for men and women respectively, are the following:

1. Where region of origin is found to have a significant influence on the likelihood of being employed in skill level IV occupations, the effect is negative relative to native-born residents, all things held similar. Exceptions to this finding apply to immigrant males from North America (with a probability 53.34 percent), West Central Asia and the Middle East (50.92 percent) and Africa (58.9 percent), who are found to have a significantly higher probability of being in skill level IV employment relative to similar native-born males. The likelihood, therefore, relative to native-born males with a probability of 40.03 percent (with a value of one) is 1.33 for male immigrants from North America, 1.27 for those from West Central Asia and the Middle East, and 1.47 for those from Africa. The likelihood that an immigrant male from Central America, South America, Caribbean and Bermuda will find skill level IV employment is 0.5 compared with a native-born resident, all things held similar, while for those from Western Europe the relative likelihood is 0.56. Immigrant groups from Southern Europe (0.63), Other Europe (0.67), and Eastern Europe (0.81) also have lower likelihood of finding skill level IV jobs relative to similar native-born males.

   The high skill employment gap seen in Table 2 between native-born and immigrant females is effected by region of origin to a greater extent than is estimated within the male sample. Female immigrants from Central America, South America, Caribbean and Bermuda, have a likelihood of finding skill level IV employment of 0.24 relative to similar native-born females, while this likelihood is 0.35 for those from Western Europe and 0.38 for those from Southern Europe. Female immigrants from Eastern Europe are slightly better off in terms of finding skill level IV employment, with a likelihood of 0.53 relative to native-born females, as are those from Other Europe with a relative likelihood of 0.55. South Asian female immigrants have a likelihood of finding high skill employment of 0.6 relative to similar native-born women, while for those from East and South-Asia the likelihood is 0.73. Remaining region of origin

variables are not found to differ significantly from being a native-born female with respect to finding skill level IV work. Over all, female immigrants experience a larger portion of the occupational skill gap as attributable to region of origin effects, relative to their male counterparts.

All other factors held similar, the estimated logistic regressions suggest that some immigrant groups, particularly females, have a disadvantage compared with native-born residents in terms of finding skill level IV employment. Differences in the transferability of human capital arise from variations in skills learned by persons growing up and working in different source regions, and in the integration and settlement framework that is offered by Canada. Diverse backgrounds may also influence occupational differences seen by gender. Immigrants have different motivations (and different entry admission categories) for coming to Canada and these reasons can also influence labour market integration.[28] Influences of push and pull factors may play a role in the occupational skill outcomes of immigrants.

2. By level of education, the logistic regression analysis shows significant increases in the relative likelihood of finding skill level IV employment for degree holders. All things held similar, a male individual holds skill level IV employment with a likelihood of approximately 3.6 for a Bachelor's degree, 4.01 for a Master's degree, and 4.3 for a doctorate degree, relative to having a secondary school certificate or less (with a value of 1). A female individual, all things held similar, holds skill level IV employment with a likelihood of 6.87 for a Bachelor's degree, 10.29 for a Master's degree, and 11.35 for a doctorate degree, in comparison to having a secondary school certificate or less. The probability a male with secondary school or less education obtains high skill employment is higher than that of a similarly educated female, resulting in higher returns to post-secondary education for women with respect to occupational skill outcomes. Results for both male and female samples support the direction of immigration policy towards emphasizing education.

[28] For example, immigrants coming from some economically developing countries may be desperate to move out of their country. Therefore, they are willing to accept an inferior job match in Canada and to come anyway, which is not the case for other immigrants from, for example, the United States, who will not leave their country if the occupational match they can have in Canada is not beneficial. Developing country immigrants may therefore self-select themselves in low skill jobs to a much greater extent than those coming from the United States.

These findings are supportive of de Silva (1997a) who, using IMDB data, decomposes the earnings differentials among categories of immigrants and examines endowments at landing and the contribution to earnings differentials. The study finds that among attributes at landing, the largest contributing factor to the wage advantages among immigrants are education level (and to a slightly lesser extent knowledge of official languages at landing), with those with a university degree having the largest relative advantage.

3. Interacting level of education with region of origin produces results supporting the hypothesis that the education of many immigrant groups is not recognized as equivalent to that of native-born residents. It is possible to compare native-born residents with different immigrant groups taking into account level of education, region of origin, and the interaction effects that occur between these two variables. This distinction allows us to see how immigrants from particular regions of origin with particular levels of education find themselves in skill level IV occupations relative to native-born residents with the same level of education, all other characteristics held similar. This aids the identification of acute gaps where the human capital of immigrant groups may be underutilized, as the inclusion of the pure effect of education level (an "average" effect of that level of education) is estimated which can be modified by the influence of region of origin.

   Immigrant males from Southern Europe with a Bachelor's degree have a 56.99 percent probability of being in skill level IV employment, while for a native-born male with a Bachelor's degree, all other characteristics held similar, the probability is 80.16 percent. In other words, Southern European immigrant males have a 0.71 likelihood of finding skill level IV work, relative to a similarly educated native-born male. Eastern European immigrant males with a Bachelor's degree have a likelihood of 0.75 relative to similarly educated native-born residents, and for a Master's degree the relative likelihood is 0.76. West Central Asian and Middle Eastern male immigrants with a Bachelor's degree have a likelihood of 0.85 relative to similarly educated native-born males, while the relative likelihood is 0.8 for a Master's degree. South Asian immigrants with a Bachelor's degree have a likelihood of 0.59 for getting skill level IV employment compared with similarly educated native-born males, while for those with a Master's degree the likelihood is 0.79. For male immigrants from East and South-East

Asia these numbers are 0.76 and 0.91 respectively. For male immigrants from Africa, the likelihood of being employed in high skill employment relative to similarly educated native-born residents is 0.83 for a Bachelor's degree and 0.92 for a Master's degree. The logistic regression indicates that significant gaps exist among immigrant and native-born males in terms of occupational skill outcomes when the interaction effect of region of origin and education level is taken into consideration.

When region of origin interacted with education level is isolated it constitutes a larger contributing factor of occupational skill gaps with native-born residents for female immigrants than is seen for their male counterparts. Northern European immigrant females with a Master's degree have a likelihood of 0.77 of finding skill level IV employment compared with similarly educated native-born females. Southern European female immigrants with a Bachelor's degree experience a likelihood of 0.32 of finding high skill work relative to similarly educated native-born females and a likelihood of 0.34 for those with a Master's degree, while these numbers are 0.45 and 0.39 respectively for Eastern European female immigrants. Female immigrants from West Central Asia and the Middle East have a likelihood of 0.56 of finding high skill employment with a Bachelor's degree and 0.65 with a Master's degree relative to similarly educated native-born females. South Asian female immigrants with a Bachelor's degree face a likelihood of finding skill level IV employment of 0.27 compared to similarly educated native-born females, while for those with a Master's degree the likelihood is 0.34. African female immigrants with a Bachelor's degree have a likelihood of finding high skilled employment of 0.5 relative to native-born females, all things held similar, while this likelihood is 0.55 for females from Central America, South America, Caribbean and Bermuda. Logistic regression results indicate that interaction effects of region of origin and education level on high skill employment are more pronounced among females.

4. According to logistic regression results, major field of study is a significant factor contributing to the likelihood of finding skill level IV employment. Hints of areas where the human capital of immigrants may be non-transferable to the Canadian labour market or is underutilized emerge when comparing the likelihood of holding a skill level IV job with the distribution of immigrant groups across field of study. The logical outcome is that immigrant groups studying

within fields found to lead to a higher probability of finding skill level IV work would be employed in high skill occupations to a greater extent than are other groups. For example, the logistic regression indicates that studying nursing leads to a likelihood of 6.32 of finding skill level IV employment for women relative to studying fine and applied arts (with a value of 1). Perhaps surprisingly, immigrant females from Central America, South America, Caribbean and Bermuda, East and South-East Asia, and North America have high relative representation within this field of study, and from what has been shown so far, these immigrant groups do not all have large involvement in high skill employment. Some fields of study estimated to have a higher likelihood of leading to high skill work relative to studying fine and applied arts are not always compatible with the distribution of immigrant groups within that field of study.

5. As a proxy for potential work experience, age is found to have a positive effect on the probability of finding skill level IV employment for both genders.

6. The logistic regression indicates that for men living in either of the three Census Metropolitan Areas (CMAs) (Montreal, Toronto or Vancouver) leads to a higher likelihood of skill level IV employment relative to living in other regions of Canada, including smaller CMAs. However, for females, it is only in Toronto and Vancouver where this geographical advantage is found in terms of obtaining high skill work.

7. By knowledge of official languages, the logistic regression analysis indicates that individuals speaking English only have a higher likelihood (1.2 for men and 1.09 for women) of finding skill level IV employment relative to speaking French only (with a value of 1), all other factors held similar. Speaking both official languages leads to an increased likelihood of 1.42 for men and 1.36 for women relative to speaking French only. Having knowledge of neither official language is found negative and strongly significant for women, leading to a likelihood of 0.62 relative to speaking French only.

8. For the male sample, the logistic regression estimates a negative relationship between all periods of immigration and being native-born (no period of immigration) in terms of finding skill level IV employment, although this correspondence is not continuously significant until

1984. Male immigrants landing in Canada during the period 1984 to 1986 have a likelihood of 0.77 of finding high skill employment relative to native-born males, all other factors held constant, while the likelihood is 0.78 for the 1987 to 1989 landing cohort. The cohort of male immigrants landing during the period 1990 to 1992 have a likelihood of finding skill level IV employment of 0.79 relative to similar native-born residents, while for those landing during 1993 to 1996 the likelihood is 0.76.

For females, immigration cohort effects on the probability of finding high skilled employment closely resemble the pattern shown in the earnings literature, with an increased disparity in occupational skill outcomes experienced by those landing in the 1990s. For female immigrants landing during the period 1990 to 1992, the likelihood of finding high skill work relative to their native-born female counterparts is 0.77, while for the 1993 to 1996 cohort the likelihood falls to 0.67. Results of the logistic regressions indicate that immigrant and native-born females have experienced a recent divergence in occupation skill level attainment attributable to cohort effects, while for immigrant men the cohort effect on occupational skill outcomes has been negative since the middle of the 1980s.

9. Having identical other characteristics – limited to the ones considered here – being a member of a visible minority results in a significantly lower likelihood (0.86 for men and 0.79 for women) of being employed in skill level IV occupations relative to non-visible minorities.

Conclusions from the analysis reflected in Tables 4B and 6B in Appendix B, the probability of finding work in skill level III or IV occupations for men and women respectively, are the following:

1. Differences in the likelihood of finding skilled employment among immigrant groups and native-born residents remain present in logistic regression estimates for both men and women when the two skilled occupation levels are pooled. Male immigrants from Western Europe (0.77), Southern Europe (0.87), Eastern Europe (0.89), and Other Europe (0.76) have a lower likelihood of being in skill level III or IV work relative to similar native-born males. Male immigrant groups from North America and West Central Asia and the Middle East no longer have an occupational advantage relative to native-born males, while those from Africa

now have a significantly lower relative likelihood of 0.9. The likelihood that a male immigrant from Central America, South America, Caribbean and Bermuda finds skilled employment relative to a native-born male, all things held similar, is 0.8, while this likelihood is 0.86 for those from East and South-East Asia and 0.87 for those from South Asia.

Female immigrants from all regions of origin, with the exception of Other, face a lower likelihood of finding skilled employment when compared with similar native-born females. With a relative likelihood of approximately 0.39, female immigrant groups from Western Europe, Southern Europe and Central America, South America, Caribbean and Bermuda have less of a chance for skilled employment than native-born females, all things held similar. Female immigrants from North America and from Northern Europe face an occupational skill gap relative to native-born females when skill level III and IV jobs are pooled. With all other factors held similar, the estimated logistic regressions suggest that some immigrant groups and particularly those of females face a disadvantage compared with similar native-born residents in terms of finding skilled employment.

2. The hypothesis that the education of many immigrant groups is not recognized as equivalent to that of native-born residents is supported when interaction effects between level of education and region of origin are included in pooled skill level III and IV logistic regressions. For male immigrants from some of the traditional regions of origin – Western, and Other Europe – education at the Bachelor's degree and Master's degree level is estimated to lead to a lower probability of finding skilled employment relative to similarly educated native-born males. A similar finding holds for male immigrants from newer regions of origin, – Southern Europe, Eastern Europe, West Central Asia and the Middle East, South Asia, East and South-East Asia, and Africa – who have lower probabilities of finding a skilled occupation relative to similarly educated males from traditional source areas. The same results also hold for female immigrants from these regions, with the exception of those from Western Europe who are not found to differ significantly from similarly educated native-born females in terms of finding skilled employment. Logistic regression results indicate that the educational degrees of members of the Canadian labour force are not uniformly regarded.

3. With skill level III and IV as the dependent variable in the logistic regressions, major field of study is found to play a determining role in occupational skill outcomes. Many areas of study are found to differ significantly from fine and applied arts (base category) in influencing the probability of holding a skill level III or IV occupation. In general, the results suggest that to be employed in skill level III or IV work, it is important that an individual have post-secondary education, with field of study chosen playing a less determining role. This finding is in accordance with policy aimed to eliminate field of study from immigration selection criteria.

4. Cohort effects on finding skilled employment for male immigrants relative to native-born men (no period of immigration) display no distinguishable trend. However, negative male cohort effects for the period of immigration 1990 to 1992 and 1993 to 1996 provide evidence in accordance with lower earnings found for immigrants landing in the 1990s. A significantly lower likelihood of finding skill level III or IV work relative to native-born males is also found for male immigrants landing prior to 1977 and during the period 1984 to 1986. For female immigrants, cohort effects on the likelihood of finding skilled employment relative to native-born women are not found significant until the 1993 to 1996 landing period, where the likelihood is 0.87.

5. In terms of visible minority status, level of education, and knowledge of official languages, results from the logistic regressions with skill level III and IV as the dependent variable are in accordance with those found in the skill level IV logistic regressions. Exceptions are that males no longer significantly benefit by living in Montreal relative to other regions in Canada, and that having knowledge of neither official language now has a significantly negative effect on the probability of males finding skilled employment.

The most critical finding of the study, and one that is found robust in all estimated logistic regressions, is that the probability of finding skilled employment differs by region of origin. This evidence supports the concept that the match between an immigrant's ethnic, linguistic, employment and educational background and the Canadian labour market affects job market integration patterns. Particularly, interaction effects between education level and region of origin

are found significant for many immigrant groups.[29] The results further indicate that the occupational skill outcome gap between immigrants and native-born residents is more acute for females.

[29] The general lack of significance found in region of origin interacted with university doctorate degrees is likely a reflection of sample selection. The sample was limited to immigrants arriving in Canada after age 24, leaving a possibility that doctorate degrees were obtained from Canadian universities and therefore do not produce a likelihood of occupational skill outcome that is different from that of native-born residents.

5. Conclusion

Estimated logistic regressions indicate that while some immigrants possess "on paper" similar endowments, the likelihood that they get work in a high skill occupation is lower than other similarly qualified individuals of the same gender. This paper measures the gap in occupational skill outcomes between similarly endowed native-born residents and immigrants, which can be interpreted in two different though not mutually exclusive ways. First, foreign education may raise the productivity of its graduates less compared with education obtained in Canada. In this case, the title of an educational degree is the same, but the worth is lower for foreign earned credentials. Second, domestic employers may be poorly informed about foreign certificates, and may adopt a risk-averse attitude by hiring domestically educated workers preferentially. Thus, an unwillingness or inability on the part of Canadian employers to recognize the experience and education of some immigrants as equivalent to that of native-born residents may be a contributing factor to non-transferability of human capital. Studies such as the present, which assess variations in the correspondence between human capital endowments and employment patterns, provide information that contributes to explanations of earnings differentials among immigrants and similar native-born residents, as well as the overall decline in recent immigrant labour market performance.

A raw exploration of 1991 and 1996 Canadian census data highlighted important differences among immigrants and native-born residents with respect to occupational skill level. In particular, both male and female immigrants from traditional source regions such as North America and Northern Europe are consistently represented in skilled occupations to a greater extent than are native-born residents. In contrast to this, some immigrant groups from less traditional source regions such as Southern Europe, Southern Asia, East and South-East Asia, and Central America, South America, Caribbean and Bermuda, are consistently employed in skilled work to a lesser extent than are native-born residents. These findings are of particular concern when viewed in the context of changing composition of immigrant origins, in which immigrants from non-traditional source regions are increasingly participating in and contributing to the Canadian labour force. These findings alone are not direct evidence that there is underutilization of human capital amongst immigrants groups, and a logistic regression model was developed that estimates the

likelihood of an immigrant attaining skilled employment while controlling for influential factors, such as education.

The findings of the study can be stated as follows. First, evidence from the estimated logistic regressions performed here reveals that immigrant occupational skill outcomes vary by region of origin, all other factors held similar. In general, where region of origin is found to have a significant influence on the likelihood of being employed in skilled occupations, the effect is negative relative to similarly endowed native-born residents. Male and female immigrants from Eastern Europe, Southern Europe, South Asia, East and South-East Asia, and Central America and South America, Caribbean and Bermuda are employed in skilled employment with a significantly lower probability than are similarly endowed native-born residents and immigrants from Northern Europe and North America. Overall, female immigrants experience a larger portion of the occupational skill gap with native-born females attributable to pure region of origin effects, relative to their male immigrant counterparts. These findings are consistent with the findings of Wanner (2000), who finds that immigrants from some non-traditional source areas are less likely to be employed in the corporate sector compared to the low-wage sector.

Second, by level of education, the logistic regression analyses show significant increases in the relative likelihood of finding skilled employment for degree holders. This familiar result – that it pays to have a university degree at landing –supports de Silva (1997a) who uses IMDB data to find that university education at landing is the largest positive influence on an immigrants earnings. This finding also supports the direction of immigration policy towards a human capital model of selection.

Third, interaction variables between education level and region of origin included in the logistic regression indicate that employers may tend to discount educational qualifications obtained from some regions of origin relative to those obtained in traditional source regions such as North America and Northern Europe. The evidence on this set of interaction terms indicates that educational qualifications obtained from regions, such as Southern Europe, Eastern Europe, West Central Asia and the Middle East, South Asia, East and South-East Asia, Africa, and Central America, South America, Caribbean and Bermuda, tend to be systematically undervalued relative

to those acquired in places such as North America and Northern Europe. There are large differences in the transferability of education obtained outside of Canada, and this is a likely contributing factor to the underutilization of immigrant human capital. This finding is consistent with the literature (e.g. Baker and Benjamin (1994), Pendakur and Pendakur (1998) and Wanner (2000)) suggesting that education obtained abroad limits the earnings and occupational opportunities of immigrants in the labour market relative to those of the native-born.

Fourth, having identical other characteristics – limited to the ones considered in this analysis – being a member of a visible minority results in a significantly lower likelihood for both men and women of being employed in skilled occupations relative to non-visible minorities. This finding is consistent with the literature, including Pendakur and Pendakur (1998) and Hum and Simpson (1999), that finds that the wage opportunities afforded different racial groups, primarily among immigrants, vary considerably. These findings, combined with the negative effect of region of origin (other than native-born) further suggest that recent immigrants may face greater labour market discrimination relative to previous cohorts, as the proportion of recent immigrants who are visible minorities has risen.

Fifth, estimation of cohort effects supports that the probability of finding employment in a skilled occupation has fallen for recent immigrants. Male immigrants landing during the periods 1984 to 1986 and 1990 to 1996 experience a negative cohort effect on the probability of finding skilled employment. For female immigrants, a negative cohort effect on the probability of finding skill level IV employment holds for those landing during the period 1990 to 1996, while for the probability of finding skill level III or IV employment, it holds for those landing during 1993 to 1996. Negative cohort effects on the probability of finding skilled employment appear to coincide with periods of economic downturn. The findings support previous studies such as Baker and Benjamin (1994) and McDonald and Worswick (1998) that find there has been a decline in the rate of labour market integration for recent immigrant cohorts.

This paper aims to alert policy and program planners to potentially important changes in immigrant composition, particularly the role of region of origin specific human capital, in influencing immigrant occupational skill outcomes. The capability of policymakers to project

immigrant occupational skill outcomes will be enhanced to the extent the relevant specific factors can be identified that influence immigrant occupational skill outcomes. From the information contained within region of origin effects, policy makers can ensure immigrants have as efficient an integration process as possible.

In general, the results indicate factors may play a role in occupational skill outcomes that are beyond the individual control of an immigrant. The analysis presented in this paper has policy implications regarding the integration of immigrants into the Canadian labour force. Qualified individuals coming to Canada need the opportunity to use their human capital to its maximum potential[30]. If this human capital is not consistent with Canadian standards, immigrants must be given the opportunity to bridge these abilities with those applicable in the labour market. Immigrants that are not doing as well as other similarly qualified individuals may be able to form a more appropriate labour force attachment through effective policy measures. In particular, female immigrants appear to experience acute gaps in occupational skill level attainment relative to their native-born female counterparts, and are a group that stands to gain large benefits from policy initiatives. This suggests a role for policy in developing and encouraging programs that would facilitate the qualification and recognition process for both immigrants and employers. Policy initiatives would involve the strengthening of credential recognition agreements with particular countries (country specific) and the provision of educational frameworks for immigrants in which their human capital is made compatible with the Canadian labour market (this might include an accelerated process by which Canadian equivalency diplomas are earned, as well as immigrant employment internships). The logistic regressions in this paper suggest that immigrant integration policy programs must be designed to complete the transferability of human capital developed abroad to the Canadian labour market. Canadian immigration policy regulates entry based human capital criteria that must be weighed appropriately within the selection system to provide an effective integration framework after landing.

[30] One commentary on the study is that when increasing from skill level III to IV, the qualifications necessary for employment may become increasingly narrow and restrictive (i.e. to be a medical doctor or lawyer). Thus, likelihood differences between skill level III and IV may not be a by-product of skill level but rather caused by more stringent qualifications. The transition matrices into the skill level IV group may be large, as the mean skill level, paper requirements, and legal requirements may be more stringent. This suggests that Canadian professional associations have a large role to play in allowing the labour market to reach its full potential.

This study opens up avenues for further research on the topic, including data development. In particular, data is needed that asks the important question "Where did you obtain your education?" A new survey, the Longitudinal Survey of Immigrants to Canada (LSIC), is currently being developed by Statistics Canada, and will include important information on education obtained before coming to Canada and since arrival. The survey will also have information on employment held before coming to Canada and since arrival, and recognition of credentials or professional qualifications from outside Canada. Areas for further research include the influence of push and pull factors on the occupational skill outcomes of immigrants, as well as further investigation of the causes of the differential occupational outcomes among males and females from different regions of origins (for example, interaction effects between region of origin and knowledge of official languages). Further studies could also examine the upward mobility of immigrants among the four occupation skill levels over time.

To be a leader in the knowledge-based global economy it is necessary for Canada to utilize the skill pool of its labour force to its maximum ability. This study lends support, by way of investigating acute gaps in occupational skill level attainment between similarly endowed immigrants and native-born residents, to the hypothesis that human capital of some immigrants may be underutilized in the Canadian labour market. Additional information that shows immigrants as a heterogeneous group allows the design of targeted and broad policies that meet specific needs. The effect of region of origin on occupational skill outcomes is an important piece of information that can not be ignored in efforts to more accurately model the transferability of human capital of immigrants to the Canadian labour market.

Appendix A

Region-of-Origin Geographical Classification

North America: United States

Northern Europe: United Kingdom

Western Europe: Germany, Netherlands

Southern Europe: Italy, Portugal, former Yugoslavia (Bosnia and Herzegovina, Croatia, Former Yugoslav Republic of Macedonia, (FYROM), Slovenia, Yugoslavia)

Eastern Europe: Poland, USSR, former (European component) (Estonia, Latvia, Lithuania, Belarus, Republic of Moldova, Russian Federation, Ukraine, USSR, n.i.e.)

Other Europe: Austria, Belgium, Czech Republic, Slovakia, Czechoslovakia, n.i.e., France, Greece, Hungary, Romania, Denmark, Finland, Iceland, Norway, Sweden, Liechtenstein, Luxembourg, Monaco, Switzerland, Bulgaria, Republic of Ireland (Eire), Albania, Andorra, Gibraltar, Malta, San Marino, Spain, Vatican City State

West Central Asia and the Middle East: Iran, Lebanon, Armenia, Azerbaijan, Georgia, Kazakhstan, Tajikistan, Turkmenistan, Uzbekistan, Afghanistan, Bahrain, Cyprus, Iraq, Israel, Jordan, Kuwait, Oman, Qatar, Saudi Arabia, Syria, Turkey, United Arab Emirates, Yemen, Palestine / West Bank / Gaza Strip

Southern Asia: India, Sri Lanka, Bangladesh, Bhutan, Maldives, Nepal, Pakistan,

East and South East Asia: China, People's Republic of, Hong Kong, Philippines, Vietnam, South Korea, Taiwan, Brunei Darussalam, Cambodia, Indonesia, Japan, Laos, Macau, Malaysia, Mongolia, Myanmar, North Korea, Singapore, Thailand

Africa: Burundi, Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Mayotte, Mozambique, Reunion, Rwanda, Seychelles, Somalia, United Republic of Tanzania, Uganda, Zambia, Zimbabwe, Algeria, Egypt, Libya, Morocco, Sudan, Tunisia, Western Sahara,

Botswana, Lesotho, Namibia, Republic of South Africa, Swaziland, Angola, Benin, Burkina Faso, Cameroon, Cape Verde, Central African Republic, Chad, Congo, Cote d'Ivoire, Equatorial Guinea, Gabon, Gambia, Ghana, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Sao Tome and Principe, Saint Helena, Senegal, Sierra Leone, Togo, Zaire.

Central America, South America, Caribbean and Bermuda: El Salvador, Belize, Costa Rica, Guatemala, Honduras, Mexico, Nicaragua, Panama, Guyana, Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Falkland Islands (Malvinas), French Guiana, Paraguay, Peru, Suriname, Uruguay, Venezuela, Jamaica, Trinidad and Tobago, Anguilla, Antigua and Barbuda, Aruba, Bahamas, Barbados, Bermuda, Cayman Islands, Cuba, Dominica, Dominican Republic, Grenada, Guadeloupe, Haiti, Martinique, Montserrat, Netherlands Antilles, Puerto Rico, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Turks and Caicos Islands, British Virgin Islands, U.S. Virgin Islands.

Other: Other countries and regions not elsewhere identified.

Appendix B

Additional Tables

Table 1B Men: Place of birth by occupation & skill level: Percent total sample by region of origin (1991 & 1996 census)

	Occupation													
	Skill level IV			Skill level III						Skill level II			Skill level I	
Immigrant place of birth	*Senior Manag.*	*Mid. & other Manag.*	*Prof.*	*Semi-Prof. & tech-nicians*	*Super-visors*	*Super-visors: crafts & trades*	*Admin. & senior clerical personnel*	*Skilled sales & service Personnel*	*Skill crafts & trade work*	*Clerical personnel*	*Intermed. Sales & service personnel*	*Semi-Skilled manual workers*	*Other sales & service personnel*	*Other manual workers*
Native-born	1.52	11.07	12.22	5.53	1.14	6.40	1.56	4.35	13.26	5.09	5.94	15.79	4.47	4.62
North America	3.43	15.99	37.02	6.33	0.86	4.83	1.29	2.79	4.40	2.68	4.29	8.15	2.04	2.04
Northern Europe	3.41	17.02	21.74	7.48	1.32	4.52	2.06	4.15	14.10	2.51	4.44	8.43	3.21	1.89
Western Europe	2.08	9.47	7.23	2.99	1.25	7.48	0.50	3.32	18.85	2.24	3.74	14.37	7.23	12.96
Southern Europe	1.10	8.65	7.34	4.20	0.98	4.86	0.61	4.69	18.12	2.00	3.22	15.46	7.79	7.96
Eastern Europe	1.37	10.79	12.19	5.74	0.85	5.74	0.65	5.25	16.63	2.22	3.49	16.56	5.71	5.02
Other Europe	1.58	9.82	17.17	4.73	0.89	3.41	1.26	5.20	10.35	4.46	4.41	17.07	6.93	4.78
W Central Asia & Middle East	1.14	15.82	17.40	6.24	0.88	1.23	1.32	7.12	5.71	5.45	6.24	7.91	4.75	1.58
Southern Asia	0.93	9.14	13.49	3.91	0.98	1.42	1.27	7.87	6.74	5.91	5.03	18.91	8.55	4.40
E & SE Asia	1.54	10.65	12.94	4.78	1.20	1.97	1.17	6.09	8.49	5.86	5.35	15.57	8.02	4.52
Africa	2.05	10.50	21.00	3.84	1.28	1.41	0.77	3.84	5.89	5.38	4.87	11.65	5.89	1.92
CA SA Carib & Bermuda	0.59	4.25	9.96	4.98	1.68	2.49	1.02	2.56	12.37	6.52	3.59	22.91	8.05	6.44
Other	1.75	7.02	15.79	7.02	0.00	5.26	1.75	4.39	16.67	3.51	2.63	15.79	8.77	2.63

Note: The difference between the sum of the individual immigrant categories and 100% is the percent falling within the "Not applicable" category (See *Table 2* for numbers).

Table 2B Women: Place of birth by occupation and skill level: Percent total sample by region of origin (1991 & 1996 census)

Immigrant place of birth	Occupation													
	Skill level IV			Skill level III						Skill level II			Skill level I	
	Senior Manag.	*Mid. & other Manag.*	*Prof.*	*Semi-Prof. & tech-nicians*	*Super-visors*	*Super-visors: crafts & trades*	*Admin. & senior clerical personnel*	*Skilled sales & service Personnel*	*Skill crafts & trade work*	*Clerical personnel*	*Intermed. Sales & service personnel*	*Semi-Skilled manual workers*	*Other sales & service personnel*	*Other manual workers*
Native-born	0.36	5.33	14.67	4.71	1.39	1.11	10.22	3.39	0.66	14.73	12.10	3.61	6.34	1.15
North America	0.39	6.61	30.16	5.98	0.94	0.79	7.80	2.52	0.39	7.95	9.37	2.83	3.31	0.79
Northern Europe	0.25	6.76	15.82	4.63	2.13	1.00	12.52	2.55	0.50	15.44	13.90	1.88	5.38	0.58
Western Europe	0.08	3.78	5.71	2.94	1.34	2.27	4.96	2.69	1.93	8.49	12.02	10.92	13.28	3.95
Southern Europe	0.19	2.67	4.51	2.13	0.48	0.82	3.01	3.01	3.10	5.38	8.29	11.54	10.14	3.69
Eastern Europe	0.31	4.19	10.73	4.57	1.07	0.90	5.29	3.63	1.38	7.61	13.08	7.72	10.52	3.08
Other Europe	0.18	3.58	10.50	3.88	1.03	1.09	5.28	2.73	1.09	11.23	9.83	9.65	9.65	5.40
W Central Asia & Middle East	0.43	6.55	10.38	2.81	0.60	0.43	7.83	3.49	0.43	13.28	7.40	3.40	5.70	1.36
Southern Asia	0.13	3.06	9.68	3.27	0.60	0.39	3.70	3.27	1.64	10.37	17.13	8.22	10.63	3.31
E & SE Asia	0.22	4.07	8.93	3.31	1.03	0.34	5.48	3.09	1.25	11.64	13.14	9.84	9.01	3.12
Africa	0.34	4.28	10.10	2.74	0.34	0.17	7.71	1.37	0.34	9.76	12.33	4.62	5.65	3.25
CA SA Carib & Bermuda	0.26	2.24	6.98	2.31	0.70	0.51	5.00	2.82	0.64	10.95	13.52	7.50	12.56	3.78
Other	0.96	5.77	14.42	5.77	0.00	0.96	6.73	3.85	0.00	8.65	8.65	3.85	12.50	1.92

Note: The difference between the sum of the individual immigrant categories and 100% is the percent falling within the "Not Applicable" category (See *Table 2* for numbers).

Table 3B **Men: Results from logistic estimation of skill level IV occupations**

Variables	Estimated coefficient β	Mean (share in the population)	β* Mean	Logistic	Likelihood in %	Standard error	Significance (T statistic)	Relative likelihood
Intercept	-5.721	1	-5.7210	-0.4386	39.2064	0.162	-35.315	NA
Member of visible minority	-0.253	0.5551	-0.1404	-0.5512	36.5585	0.053	-4.774	0.8582
Not member of visible minority	0	0.4449	0.0000	-0.2982	42.5996	0	0	1
Census 1991	0	0.51	0.0000	-0.1402	46.4998	0	0	1
Census 1996	-0.609	0.49	-0.2984	-0.7492	32.0988	0.055	-11.073	0.6903
Years since immigration	0.022	1.663	0.0366	-0.4500	38.9352	0.016	1.375	1
Years since migration squared	-0.0001	32.9557	-0.0033	-0.4720	38.4134	0.0001	-1.000	0.9866
Immigrant region of origin								
Native-born	0	0.8533	0.0000	-0.4042	40.0298	0	0.000	1
North America	0.538	0.0057	0.0031	0.1338	53.3394	0.254	2.118	1.3325
North Europe	0.218	0.0149	0.0032	-0.1862	45.3578	0.141	1.546	1.1331
West Europe	-0.846	0.0074	-0.0063	-1.2502	22.2661	0.186	-4.548	0.5562
South Europe	-0.703	0.015	-0.0105	-1.1072	24.8389	0.125	-5.624	0.6205
East Europe	-0.321	0.0188	-0.0060	-0.7252	32.6244	0.13	-2.469	0.8150
Other Europe	-0.597	0.0167	-0.0100	-1.0012	26.8701	0.174	-3.431	0.6713
W Central Asia & Middle East	0.441	0.0069	0.0030	0.0368	50.9193	0.178	2.478	1.2720
South Asia	-0.057	0.0125	-0.0007	-0.4612	38.6695	0.149	-0.383	0.9660
E & SE Asia	-0.097	0.0398	-0.0039	-0.5012	37.7253	0.097	-1.000	0.9424
Africa	0.764	0.0047	0.0036	0.3598	58.8986	0.237	3.224	1.4714
C & S America, Carib & Berm	-0.99	0.0083	-0.0082	-1.3942	19.8734	0.243	-4.074	0.4965
Other	-2.95	0.0006	-0.0018	-3.3542	3.3757	2.203	-1.339	0.0843
Highest level schooling								
SS or less	0	0.4051	0.0000	-1.2642	22.0258	0	0.000	1
Trades	0.269	0.059	0.0159	-0.9952	26.9894	0.043	6.256	1.2254
Post secondary	0.879	0.3596	0.3161	-0.3852	40.4882	0.024	36.625	1.8382
University BA	2.592	0.134	0.3473	1.3278	79.0483	0.034	76.235	3.5889
University MA	3.289	0.0342	0.1125	2.0248	88.3380	0.053	62.057	4.0107
University PHD	4.166	0.0081	0.0337	2.9018	94.7937	0.146	28.534	4.3038

Table 3B (Continued)

Variables	Estimated coefficient β	Mean (share in the population)	β* Mean	Logistic	Likelihood in %	Standard error	Significance (T statistic)	Relative likelihood
Native-born highest level schooling								
SS or less	0	0.3548	0.0000	-1.1957	23.2239	0	0.000	1
Trades	0	0.0521	0.0000	-0.9267	28.3592	0	0.000	1
Post secondary	0	0.3084	0.0000	-0.3167	42.1477	0	0.000	1
University BA	0	0.1094	0.0000	1.3963	80.1594	0	0.000	1
University MA	0	0.0244	0.0000	2.0933	89.0249	0	0.000	1
University PHD	0	0.0042	0.0000	2.9703	95.1214	0	0.000	1
North America highest level schooling								
SS or less	0	0.0007	0.0000	-0.6577	34.1254	0	0.000	1.4694
Trades	-0.433	0.0001	0.0000	-0.8280	30.4074	0.682	-0.635	1.0722
Post secondary	-0.223	0.0016	-0.0004	-0.0080	49.8007	0.286	-0.780	1.1816
University BA	-0.585	0.0016	-0.0009	1.3430	79.2988	0.285	-2.053	0.9893
University MA	-0.372	0.0009	-0.0003	2.2530	90.4911	0.339	-1.097	1.0165
University PhD	-0.63	0.0007	-0.0004	2.8720	94.6446	0.453	-1.391	0.9950
North Europe highest level schooling								
SS or less	0	0.0029	0.0000	-0.9840	27.2104	0	0.000	1.1717
Trades	0.036	0.0013	0.0000	-0.6790	33.6491	0.218	0.165	1.1865
Post secondary	0.079	0.007	0.0006	-0.0260	49.3507	0.143	0.552	1.1709
University BA	0.102	0.0022	0.0002	1.7100	84.6840	0.189	0.540	1.0564
University MA	-0.105	0.0009	-0.0001	2.2000	90.0252	0.289	-0.363	1.0112
University PhD	-0.063	0.0006	0.0000	3.1253	95.7924	0.501	-0.126	1.0071
West Europe highest level schooling								
SS or less	0	0.0036	0.0000	-2.0417	11.4893	0	0.000	0.4947
Trades	0.609	0.0005	0.0003	-1.1637	23.7994	0.403	1.511	0.8392
Post secondary	0.719	0.0028	0.0020	-0.4437	39.0857	0.212	3.392	0.9273
University BA	0.698	0.0004	0.0003	1.2483	77.7003	0.357	1.955	0.9693
University MA	0.579	0.0002	0.0001	1.8263	86.1319	0.543	1.066	0.9675
University PhD	0.535	0.00004	0.0000	2.6593	93.4581	1.113	0.481	0.9825

Table 3B (Continued)

Variables	Estimated coefficient β	Mean (share in the population)	β* Mean	Logistic	Likelihood in %	Standard error	Significance (T statistic)	Relative likelihood
South Europe highest level schooling								
SS or less	0	0.0084	0.0000	-1.8987	13.0254	0	0.000	0.5609
Trades	0.138	0.0008	0.0001	-1.4917	18.3665	0.309	0.447	0.6476
Post secondary	0.252	0.0034	0.0009	-0.7677	31.6974	0.157	1.605	0.7521
University BA	-0.412	0.0016	-0.0007	0.2813	56.9862	0.17	-2.424	0.7109
University MA	-0.208	0.0005	-0.0001	1.1823	76.5359	0.266	-0.782	0.8597
University PhD	-1.12	0.0001	-0.0001	1.1473	75.9015	0.496	-2.258	0.7979
East Europe highest level schooling								
SS or less	0	0.0055	0.0000	-1.5167	17.9946	0	0.000	0.7748
Trades	-0.271	0.0016	-0.0004	-1.5187	17.9651	0.256	-1.059	0.6335
Post secondary	-0.163	0.0077	-0.0013	-0.8007	30.9873	0.137	-1.190	0.7352
University BA	-0.661	0.0018	-0.0012	0.4143	60.2116	0.168	-3.935	0.7511
University MA	-1.053	0.0016	-0.0017	0.7193	67.2450	0.179	-5.883	0.7554
University PhD	-0.824	0.0005	-0.0004	1.8253	86.1200	0.344	-2.395	0.9054
Other Europe highest level schooling								
SS or less	0	0.0036	0.0000	-1.7927	14.2741	0	0.000	0.6146
Trades	0.502	0.0004	0.0002	-1.0217	26.4694	0.4	1.255	0.9334
Post secondary	0.245	0.0039	0.0010	-0.6687	33.8785	0.193	1.269	0.8038
University BA	-0.409	0.0022	-0.0009	0.3903	59.6352	0.198	-2.066	0.7440
University MA	-0.259	0.0011	-0.0003	1.2373	77.5092	0.24	-1.079	0.8706
University PhD	0.488	0.0003	0.0001	2.8613	94.5899	0.568	0.859	0.9944
W Central Asia & Middle East highest level schooling								
SS or less	0	0.0019	0.0000	-0.7547	31.9796	0	0.000	1.3770
Trades	0.084	0.0001	0.0000	-0.4017	40.0901	0.609	0.138	1.4137
Post secondary	-0.312	0.0021	-0.0007	-0.1877	45.3209	0.21	-1.486	1.0753
University BA	-1.086	0.0019	-0.0021	0.7513	67.9459	0.206	-5.272	0.8476
University MA	-1.617	0.0007	-0.0011	0.9173	71.4489	0.265	-6.102	0.8026
University PhD	-1.606	0.0001	-0.0002	1.8053	85.8792	0.56	-2.868	0.9028

Table 3B (Continued)

Variables	Estimated coefficient β	Mean (share in the population)	β* Mean	Logistic	Likelihood in %	Standard error	Significance (T statistic)	Relative likelihood
South Asia highest level schooling								
SS or less	0	0.0044	0.0000	-1.2527	22.2231	0	0.000	0.9569
Trades	-0.967	0.0003	-0.0003	-1.9507	12.4476	0.744	-1.300	0.4389
Post secondary	-0.469	0.0037	-0.0017	-0.8427	30.0964	0.177	-2.650	0.7141
University BA	-1.442	0.0029	-0.0042	-0.1027	47.4345	0.168	-8.583	0.5918
University MA	-1.154	0.0009	-0.0010	0.8823	70.7296	0.22	-5.245	0.7945
University PhD	-0.209	0.0003	-0.0001	2.7043	93.7279	0.485	-0.431	0.9854
East & South East Asia highest level schooling								
SS or less	0	0.0146	0.0000	-1.2927	21.5394	0	0.000	0.9275
Trades	0.041	0.0013	0.0001	-0.9827	27.2354	0.222	0.185	0.9604
Post secondary	-0.252	0.0133	-0.0034	-0.6657	33.9458	0.094	-2.681	0.8054
University BA	-0.852	0.0076	-0.0065	0.4473	60.9994	0.097	-8.784	0.7610
University MA	-0.537	0.0021	-0.0011	1.4593	81.1424	0.152	-3.533	0.9115
University PhD	-0.87	0.0008	-0.0007	2.0033	88.1142	0.276	-3.152	0.9263
Africa highest level schooling								
SS or less	0	0.0009	0.0000	-0.4317	39.3718	0	0.000	1.6953
Trades	-0.368	0.0001	0.0000	-0.5307	37.0351	0.673	-0.547	1.3059
Post secondary	-0.939	0.0017	-0.0016	-0.4917	37.9491	0.276	-3.402	0.9004
University BA	-1.462	0.0014	-0.0020	0.6983	66.7808	0.268	-5.455	0.8331
University MA	-1.331	0.0004	-0.0005	1.5263	82.1463	0.345	-3.858	0.9227
University PhD	-1.743	0.0002	-0.0003	1.9913	87.9879	0.521	-3.345	0.9250
C & S America, Caribbean & Bermuda highest level schooling								
SS or less	0	0.0035	0.0000	-2.1857	10.1041	0	0.000	0.4351
Trades	-0.279	0.0004	-0.0001	-2.1957	10.0136	0.757	-0.369	0.3531
Post secondary	0.302	0.0033	0.0010	-1.0047	26.8016	0.271	1.114	0.6359
University BA	0.344	0.0008	0.0003	0.7503	67.9242	0.295	1.166	0.8474
University MA	0.345	0.0003	0.0001	1.4483	80.9735	0.42	0.821	0.9096
University PhD	3.958	0.00009	0.0004	5.9383	99.7370	3.419	1.158	1.0485

Table 3B (Continued)

Variables	Estimated coefficient β	Mean (share in the population)	β* Mean	Logistic	Likelihood in %	Standard error	Significance (T statistic)	Relative likelihood
Other highest level schooling								
SS or less	0	0.0002	0.0000	-4.1457	1.5585	0	0.000	0.0671
Trades	4.663	0.00004	0.0002	0.7863	68.7034	2.342	1.991	2.4226
Post secondary	3.114	0.0003	0.0009	-0.1527	46.1896	2.229	1.397	1.0959
University BA	2.637	0.00006	0.0002	1.0833	74.7116	2.311	1.141	0.9320
University MA	6.959	0.00002	0.0001	6.1023	99.7767	6.94	1.003	1.1208
University PhD	5.692	0.00002	0.0001	5.7123	99.6706	8.062	0.706	1.0478
Major field of study								
Fine & applied arts	0	0.0284	0.0000	-0.7211	32.7145	0	0.000	1
Educ, rec & counseling	0.949	0.0168	0.0159	0.2279	55.6723	0.061	15.557	1.7018
Humanities & related fields	0.277	0.026	0.0072	-0.4441	39.0758	0.061	4.541	1.1944
Soc. science & related fields	0.192	0.046	0.0088	-0.5291	37.0721	0.056	3.429	1.1332
Business & commerce	0.749	0.0509	0.0381	0.0279	50.6968	0.054	13.870	1.5497
Financial management	0.965	0.0159	0.0153	0.2439	56.0668	0.066	14.621	1.7138
Ind & institutional management & administration	0.19	0.0188	0.0036	-0.5311	37.0254	0.065	2.923	1.1318
Mkt, merch, retailing & sales	0.754	0.0211	0.0159	0.0329	50.8218	0.064	11.781	1.5535
Secretarial science	-0.254	0.1036	-0.0263	-0.9751	27.3860	0.054	-4.704	0.8371
Agric. & bio. sciences/tech	0.047	0.0135	0.0006	-0.6741	33.7573	0.073	0.644	1.0319
Engineering & applied sciences	0.85	0.0264	0.0224	0.1289	53.2174	0.061	13.934	1.6267
Building technologies	0.005	0.0333	0.0002	-0.7161	32.8246	0.06	0.083	1.0034
Data proc & computer sci/tech	1.455	0.0684	0.0995	0.7339	67.5655	0.08	18.188	2.0653
Electronic & electrical tech	0.048	0.2807	0.0135	-0.6731	33.7797	0.054	0.889	1.0326
Other engineering & applied sciences, technology & trades	-0.2	0.0544	-0.0109	-0.9211	28.4728	0.059	-3.390	0.8703
Nursing	1.967	0.0012	0.0024	1.2459	77.6585	0.16	12.294	2.3738
Other health prof, sciences & technology	0.917	0.0094	0.0086	0.1959	54.8812	0.077	11.909	1.6776
Math & physical sciences	0.893	0.011	0.0098	0.1719	54.2863	0.075	11.907	1.6594
All other	-0.191	0.0004	-0.0001	-0.9121	28.6565	0.349	-0.547	0.8760
No post secondary	0.246	0.2349	0.0578	-0.4751	38.3404	0.055	4.473	1.1720

Table 3B (Continued)

Variables	Estimated coefficient β	Mean (share in the population)	β* Mean	Logistic	Likelihood in %	Standard error	Significance (T statistic)	Relative likelihood
All other CMAs & regions	0	0.656	0.0000	-0.4999	37.7554	0	0.000	1
Montreal	0.067	0.1334	0.0089	-0.4329	39.3424	0.023	2.913	1.0420
Toronto	0.285	0.1451	0.0414	-0.2149	44.6471	0.02	14.250	1.1825
Vancouver	0.168	0.0655	0.0110	-0.3319	41.7768	0.028	6.000	1.1065
Knowledge of official languages								
French only	0	0.1423	0.0000	-0.7406	32.2863	0	0.000	1
English only	0.285	0.6378	0.1818	-0.4556	38.8019	0.025	11.400	1.2018
Neither	-0.165	0.0084	-0.0014	-0.9056	28.7892	0.116	-1.422	0.8917
English & French	0.575	0.2115	0.1216	-0.1656	45.8683	0.026	22.115	1.4207
Age	0.141	40.1311	5.6585	-0.4386	39.2064	0.007	20.143	1
Age squared	-0.001	1700.1205	-1.7001	-0.4386	39.2064	0.0001	-10.000	1
Period of immigration								
No year (native-born)	0	0.8533	0.0000	-0.3917	40.3306	0	0.000	1.0000
Prior to 1977	-0.33	0.0543	-0.0179	-0.7217	32.7017	0.203	-1.626	0.8108
1978-1980	-0.382	0.0097	-0.0037	-0.7737	31.5677	0.18	-2.122	0.7827
1981-1983	-0.19	0.01	-0.0019	-0.5817	35.8539	0.162	-1.173	0.8890
1984-1986	-0.413	0.0101	-0.0042	-0.8047	30.9019	0.139	-2.971	0.7662
1987-1989	-0.383	0.0183	-0.0070	-0.7747	31.5461	0.105	-3.648	0.7822
1990-1992	-0.377	0.0181	-0.0068	-0.7687	31.6758	0.091	-4.143	0.7854
1993-1996	-0.416	0.013	-0.0054	-0.8077	30.8379	0.091	-4.571	0.7646
Legal marital status								
Single	0	0.2544	0.0000	-0.8060	30.8737	0	0.000	1.0000
Divorced	0.186	0.0794	0.0148	-0.6200	34.9774	0.031	6.000	1.1329
Married	0.553	0.6267	0.3466	-0.2530	43.7078	0.019	29.105	1.4157
Separated	0.177	0.0338	0.0060	-0.6290	34.7730	0.042	4.214	1.1263
Widowed	0.012	0.0057	0.0001	-0.7940	31.1304	0.101	0.119	1.0083

* This logistic regression is modeling the probability that a male individual is employed in skill level IV work and was estimated with 163,139 observations.
** Cox and Snell R Square: .239; Nagelkerke R Square: .354; Model Chi-Square: 44522.415 with 119 DF (p=0.000); percentage of correct predictions: 82.3%.
NA Not Applicable

Table 4B **Men: Results from logistic estimation of skill level III and IV occupations**

Variables	Estimated coefficient β	Mean (share in the population)	β* Mean	Logistic	Likelihood in %	Standard error	Significance (T statistic)	Relative likelihood
Intercept	-2.868	1	-2.8680	1.1970	76.7987	0.127	-22.583	NA
Member of visible minority	-0.304	0.5551	-0.1688	1.0617	74.3021	0.044	-6.909	0.9326
Not member of visible minority	0	0.4449	0.0000	1.3657	79.6689	0	0	1
Census 1991	0	0.51	0.0000	1.3778	79.8636	0	0	1
Census 1996	-0.369	0.49	-0.1808	1.0088	73.2783	0.048	-7.688	0.9175
Years since migration	0.065	1.663	0.1081	1.1858	76.5996	0.013	5.000	1
Years since migration squared	-0.001	32.9557	-0.0330	1.1208	75.4144	0.0001	-10.000	0.9845
Immigrant region of origin								
Native-born	0	0.8533	0.0000	1.2775	78.2026	0	0.000	1
North America	-0.101	0.0057	-0.0006	1.1765	76.4320	0.198	-0.510	0.9774
North Europe	-0.214	0.0149	-0.0032	1.0635	74.3362	0.11	-1.945	0.9506
West Europe	-0.905	0.0074	-0.0067	0.3725	59.2066	0.107	-8.458	0.7571
South Europe	-0.536	0.015	-0.0080	0.7415	67.7327	0.08	-6.700	0.8661
East Europe	-0.463	0.0188	-0.0087	0.8145	69.3071	0.089	-5.202	0.8862
Other Europe	-0.918	0.0167	-0.0153	0.3595	58.8923	0.106	-8.660	0.7531
W Central Asia & Middle East	-0.177	0.0069	-0.0012	1.1005	75.0356	0.131	-1.351	0.9595
South Asia	-0.506	0.0125	-0.0063	0.7715	68.3848	0.101	-5.010	0.8745
E & SE Asia	-0.546	0.0398	-0.0217	0.7315	67.5137	0.071	-7.690	0.8633
Africa	-0.425	0.0047	-0.0020	0.8525	70.1094	0.196	-2.168	0.8965
C & S America, Carib & Berm	-0.762	0.0083	-0.0063	0.5155	62.6098	0.117	-6.513	0.8006
Other	-0.666	0.0006	-0.0004	0.6115	64.8286	0.38	-1.753	0.8290
Highest level schooling								
SS or less	0	0.4051	0.0000	0.5833	64.1830	0	0.000	1
Trades	0.317	0.059	0.0187	0.9003	71.1014	0.031	10.226	1.1078
Post secondary	0.702	0.3596	0.2524	1.2853	78.3353	0.018	39.000	1.2205
University BA	1.761	0.134	0.2360	2.3443	91.2481	0.033	53.364	1.4217
University MA	2.421	0.0342	0.0828	3.0043	95.2769	0.064	37.828	1.4845
University PHD	2.932	0.0081	0.0237	3.5153	97.1120	0.183	16.022	1.5130

Table 4B (Continued)

Variables	Estimated coefficient β	Mean (share in the population)	β* Mean	Logistic	Likelihood in %	Standard error	Significance (T statistic)	Relative likelihood
Native-born highest level schooling								
SS or less	0	0.3548	0.0000	0.7057	66.9458	0	0.000	1
Trades	0	0.0521	0.0000	1.0227	73.5505	0	0.000	1
Post secondary	0	0.3084	0.0000	1.4077	80.3408	0	0.000	1
University BA	0	0.1094	0.0000	2.4667	92.1777	0	0.000	1
University MA	0	0.0244	0.0000	3.1267	95.7982	0	0.000	1
University PHD	0	0.0042	0.0000	3.6377	97.4363	0	0.000	1
North America highest level schooling								
SS or less	0	0.0007	0.0000	0.6047	64.6738	0	0.000	0.9661
Trades	-0.578	0.0001	-0.0001	0.3370	58.3470	0.476	-1.214	0.7933
Post secondary	-0.278	0.0016	-0.0004	1.0220	73.5369	0.236	-1.178	0.9153
University BA	-0.107	0.0016	-0.0002	2.2520	90.4826	0.267	-0.401	0.9816
University MA	0.231	0.0009	0.0002	3.2500	96.2674	0.401	0.576	1.0049
University PhD	0.265	0.0007	0.0002	3.7950	97.8012	0.638	0.415	1.0037
North Europe highest level schooling								
SS or less	0	0.0029	0.0000	0.4850	61.8936	0	0.000	0.9245
Trades	0.022	0.0013	0.0000	0.8240	69.5092	0.184	0.120	0.9451
Post secondary	0.118	0.007	0.0008	1.3050	78.6681	0.122	0.967	0.9792
University BA	0.337	0.0022	0.0007	2.5830	92.9762	0.226	1.491	1.0087
University MA	0.538	0.0009	0.0005	3.4440	96.9053	0.469	1.147	1.0116
University PhD	0.938	0.0006	0.0006	4.3617	98.7404	0.942	0.996	1.0134
West Europe highest level schooling								
SS or less	0	0.0036	0.0000	-0.1993	45.0347	0	0.000	0.6727
Trades	0.578	0.0005	0.0003	0.6957	66.7241	0.279	2.072	0.9072
Post secondary	0.528	0.0028	0.0015	1.0307	73.7058	0.146	3.616	0.9174
University BA	0.055	0.0004	0.0000	1.6167	83.4344	0.36	0.153	0.9051
University MA	0.642	0.0002	0.0001	2.8637	94.6024	0.757	0.848	0.9875
University PhD	-0.263	0.00004	0.0000	2.4697	92.1993	1.108	-0.237	0.9463

Table 4B (Continued)

Variables	Estimated coefficient β	Mean (share in the population)	β* Mean	Logistic	Likelihood in %	Standard error	Significance (T statistic)	Relative likelihood
South Europe highest level schooling								
SS or less	0	0.0084	0.0000	0.1697	54.2332	0	0.000	0.8101
Trades	0.317	0.0008	0.0003	0.8037	69.0772	0.207	1.531	0.9392
Post secondary	-0.088	0.0034	-0.0003	0.7837	68.6484	0.109	-0.807	0.8545
University BA	-1.059	0.0016	-0.0017	0.8717	70.5106	0.148	-7.155	0.7649
University MA	-0.709	0.0005	-0.0004	1.8817	86.7810	0.296	-2.395	0.9059
University PhD	-1.616	0.0001	-0.0002	1.4857	81.5437	0.546	-2.960	0.8369
East Europe highest level schooling								
SS or less	0	0.0055	0.0000	0.2427	56.0387	0	0.000	0.8371
Trades	-0.279	0.0016	-0.0004	0.2807	56.9726	0.153	-1.824	0.7746
Post secondary	-0.349	0.0077	-0.0027	0.5957	64.4679	0.094	-3.713	0.8024
University BA	-0.797	0.0018	-0.0014	1.2067	76.9720	0.156	-5.109	0.8350
University MA	-1.124	0.0016	-0.0018	1.5397	82.3426	0.186	-6.043	0.8595
University PhD	-0.67	0.0005	-0.0003	2.5047	92.4473	0.444	-1.509	0.9488
Other Europe highest level schooling								
SS or less	0	0.0036	0.0000	-0.2123	44.7132	0	0.000	0.6679
Trades	0.427	0.0004	0.0002	0.5317	62.9887	0.259	1.649	0.8564
Post secondary	0.154	0.0039	0.0006	0.6437	65.5597	0.126	1.222	0.8160
University BA	-0.475	0.0022	-0.0010	1.0737	74.5306	0.152	-3.125	0.8086
University MA	-0.648	0.0011	-0.0007	1.5607	82.6458	0.221	-2.932	0.8627
University PhD	1.31	0.0003	0.0004	4.0297	98.2531	0.998	1.313	1.0084
W Central Asia & Middle East highest level schooling								
SS or less	0	0.0019	0.0000	0.5287	62.9188	0	0.000	0.9398
Trades	-0.482	0.0001	0.0000	0.3637	58.9944	0.491	-0.982	0.8021
Post secondary	-0.464	0.0021	-0.0010	0.7667	68.2814	0.164	-2.829	0.8499
University BA	-1.01	0.0019	-0.0019	1.2797	78.2404	0.177	-5.706	0.8488
University MA	-1.561	0.0007	-0.0011	1.3887	80.0390	0.261	-5.981	0.8355
University PhD	-1.202	0.0001	-0.0001	2.2587	90.5401	0.669	-1.797	0.9292

Table 4B (Continued)

Variables	Estimated coefficient β	Mean (share in the population)	β* Mean	Logistic	Likelihood in %	Standard error	Significance (T statistic)	Relative likelihood
South Asia highest level schooling								
SS or less	0	0.0044	0.0000	0.1997	54.9768	0	0.000	0.8212
Trades	-0.885	0.0003	-0.0003	-0.3683	40.8960	0.351	-2.521	0.5560
Post secondary	-0.702	0.0037	-0.0026	0.1997	54.9768	0.121	-5.802	0.6843
University BA	-1.344	0.0029	-0.0039	0.6167	64.9475	0.13	-10.338	0.7046
University MA	-1.139	0.0009	-0.0010	1.4817	81.4834	0.214	-5.322	0.8506
University PhD	-0.854	0.0003	-0.0003	2.2777	90.7016	0.484	-1.764	0.9309
East & South East Asia highest level schooling								
SS or less	0	0.0146	0.0000	0.1597	53.9849	0	0.000	0.8064
Trades	-0.156	0.0013	-0.0002	0.3207	57.9503	0.152	-1.026	0.7879
Post secondary	-0.443	0.0133	-0.0059	0.4187	60.3180	0.065	-6.815	0.7508
University BA	-0.849	0.0076	-0.0065	1.0717	74.4926	0.082	-10.354	0.8081
University MA	-0.726	0.0021	-0.0015	1.8547	86.4682	0.161	-4.509	0.9026
University PhD	-0.636	0.0008	-0.0005	2.4557	92.0980	0.334	-1.904	0.9452
Africa highest level schooling								
SS or less	0	0.0009	0.0000	0.2807	56.9726	0	0.000	0.8510
Trades	-0.814	0.0001	-0.0001	-0.2163	44.6143	0.505	-1.612	0.6066
Post secondary	-0.66	0.0017	-0.0011	0.3227	57.9990	0.226	-2.920	0.7219
University BA	-0.775	0.0014	-0.0011	1.2667	78.0183	0.24	-3.229	0.8464
University MA	-1.054	0.0004	-0.0004	1.6477	83.8584	0.338	-3.118	0.8754
University PhD	-0.785	0.0002	-0.0002	2.4277	91.8918	0.61	-1.287	0.9431
C & S America, Caribbean & Bermuda highest level schooling								
SS or less	0	0.0035	0.0000	-0.0563	48.5937	0	0.000	0.7259
Trades	-0.326	0.0004	-0.0001	-0.0653	48.3689	0.291	-1.120	0.6576
Post secondary	-0.11	0.0033	-0.0004	0.5357	63.0819	0.136	-0.809	0.7852
University BA	-0.355	0.0008	-0.0003	1.3497	79.4086	0.222	-1.599	0.8615
University MA	-0.595	0.0003	-0.0002	1.7697	85.4424	0.404	-1.473	0.8919
University PhD	2.763	0.00009	0.0002	5.6387	99.6455	3.444	0.802	1.0227

Table 4B (Continued)

Variables	Estimated coefficient β	Mean (share in the population)	β* Mean	Logistic	Likelihood in %	Standard error	Significance (T statistic)	Relative likelihood
Other highest level schooling								
SS or less	0	0.0002	0.0000	0.0397	50.9932	0	0.000	0.7617
Trades	5.282	0.00004	0.0002	5.6387	99.6455	5.011	1.054	1.3548
Post secondary	0.486	0.0003	0.0001	1.2277	77.3422	0.483	1.006	0.9627
University BA	-0.483	0.00006	0.0000	1.3177	78.8804	0.882	-0.548	0.8557
University MA	3.544	0.00002	0.0001	6.0047	99.7539	6.728	0.527	1.0413
University PhD	2.407	0.00002	0.0000	5.3787	99.5408	7.754	0.310	1.0216
Major field of study								
Fine & applied arts	0	0.0284	0.0000	1.2097	77.0241	0	0.000	1
Educ, rec & counselling	0.322	0.0168	0.0054	1.5317	82.2251	0.06	5.367	1.0675
Humanities & related fields	-0.152	0.026	-0.0040	1.0577	74.2246	0.057	-2.667	0.9637
Soc. science & related fields	-0.036	0.046	-0.0017	1.1737	76.3808	0.052	-0.692	0.9916
Business & commerce	0.212	0.0509	0.0108	1.4217	80.5601	0.05	4.240	1.0459
Financial management	0.09	0.0159	0.0014	1.2997	78.5780	0.062	1.452	1.0202
Ind & institutional management & administration	0.223	0.0188	0.0042	1.4327	80.7318	0.06	3.717	1.0481
Mkt, merch, retailing & sales	0.43	0.0211	0.0091	1.6397	83.7491	0.064	6.719	1.0873
Secretarial science	0.411	0.1036	0.0426	1.6207	83.4888	0.046	8.935	1.0839
Agric & bio sciences/tech	0.084	0.0135	0.0011	1.2937	78.4768	0.064	1.313	1.0189
Engineering & applied sciences	0.699	0.0264	0.0185	1.9087	87.0870	0.063	11.095	1.1306
Building technologies	0.072	0.0333	0.0024	1.2817	78.2735	0.052	1.385	1.0162
Data proc. & computer sci/tech	0.397	0.0684	0.0272	1.6067	83.2949	0.078	5.090	1.0814
Electronic & electrical tech	-0.236	0.2807	-0.0662	0.9737	72.5851	0.046	-5.130	0.9424
Other engineering & applied sciences, technology & trades	0.291	0.0544	0.0158	1.5007	81.7675	0.049	5.939	1.0616
Nursing	0.591	0.0012	0.0007	1.8007	85.8231	0.172	3.436	1.1142
Other health prof, sciences & technology	0.465	0.0094	0.0044	1.6747	84.2198	0.079	5.886	1.0934
Math & physical sciences	0.348	0.011	0.0038	1.5577	82.6019	0.079	4.405	1.0724
All other	-0.272	0.0004	-0.0001	0.9377	71.8630	0.25	-1.088	0.9330
No post secondary	-0.375	0.2349	-0.0881	0.8347	69.7342	0.047	-7.979	0.9054

Table 4B (Continued)

Variables	Estimated coefficient β	Mean (share in the population)	β* Mean	Logistic	Likelihood in %	Standard error	Significance (T statistic)	Relative likelihood
All other CMAs & regions	0	0.656	0.0000	1.1869	76.6179	0	0.000	1
Montreal	-0.032	0.1334	-0.0043	1.1549	76.0397	0.019	-1.684	0.9925
Toronto	0.045	0.1451	0.0065	1.2319	77.4144	0.018	2.500	1.0104
Vancouver	0.12	0.0655	0.0079	1.3069	78.6987	0.023	5.217	1.0272
Knowledge of official languages								
French only	0	0.1423	0.0000	1.0452	73.9857	0	0.000	1
English only	0.155	0.6378	0.0989	1.2002	76.8565	0.017	9.118	1.0388
Neither	-0.048	0.0084	-0.0004	0.9972	73.0513	0.067	-0.716	0.9874
English & French	0.252	0.2115	0.0533	1.2972	78.5368	0.019	13.263	1.0615
Age	0.125	40.1311	5.0164	1.1970	76.7987	0.005	25.000	1
Age squared	-0.001	1700.1205	-1.7001	1.1970	76.7987	0.0001	-10.000	1
Period of immigration								
No year (native-born)	0	0.8533	0.0000	1.2372	77.5082	0	0.000	1.0000
Prior to 1977	-0.44	0.0543	-0.0239	0.7972	68.9383	0.166	-2.651	0.8894
1978-1980	-0.259	0.0097	-0.0025	0.9782	72.6758	0.146	-1.774	0.9377
1981-1983	-0.225	0.01	-0.0023	1.0122	73.3457	0.133	-1.692	0.9463
1984-1986	-0.303	0.0101	-0.0031	0.9342	71.7934	0.112	-2.705	0.9263
1987-1989	-0.098	0.0183	-0.0018	1.1392	75.7539	0.085	-1.153	0.9774
1990-1992	-0.204	0.0181	-0.0037	1.0332	73.7543	0.074	-2.757	0.9516
1993-1996	-0.235	0.013	-0.0031	1.0022	73.1498	0.075	-3.133	0.9438
Legal marital status								
Single	0	0.2544	0.0000	0.7807	68.5834	0	0.000	1.0000
Divorced	0.171	0.0794	0.0136	0.9517	72.1460	0.023	7.435	1.0519
Married	0.629	0.6267	0.3942	1.4097	80.3721	0.014	44.929	1.1719
Separated	0.212	0.0338	0.0072	0.9927	72.9624	0.032	6.625	1.0638
Widowed	0.233	0.0057	0.0013	1.0137	73.3746	0.073	3.192	1.0699

* This logistic regression is modeling the probability that a male individual is employed in skill level III or IV work and was estimated with 163,139 observations.
** Cox and Snell R Square: .165; Nagelkerke R Square: .221; Model Chi-Square: 29295.700 with 119 DF (p=0.000); percentage of correct predictions: 67.4%.
NA Not Applicable

Table 5B **Women: Results from logistic estimation of skill level IV occupations**

Variables	Estimated coefficient β	Mean (share in the population)	β* Mean	Logistic	Likelihood in %	Standard error	Significance (T statistic)	Relative likelihood
Intercept	-5.918	1	-5.9180	-1.8978	13.0360	0.171	-34.608	NA
Member of visible minority	-0.268	0.5572	-0.1493	-2.0165	11.7486	0.061	-4.393	0.7925
Not member of visible minority	0	0.4428	0.0000	-1.7485	14.8242	0	0	1
Census 1991	0	0.51	0.0000	-1.6293	16.3931	0	0	1
Census 1996	-0.548	0.49	-0.2685	-2.1773	10.1811	0.062	-8.839	0.6211
Years since immigration	0.022	1.7062	0.0375	-1.9100	12.8980	0.018	1.222	1
Years since migration squared	-0.0001	34.0989	-0.0034	-1.9320	12.6528	0.0001	-1.000	0.9810
Immigrant region of origin								
Native-born	0	0.8526	0.0000	-1.8165	13.9854	0	0.000	1
North America	-0.274	0.0076	-0.0021	-2.0905	11.0023	0.292	-0.938	0.7867
North Europe	0.037	0.0144	0.0005	-1.7795	14.4364	0.144	0.257	1.0323
West Europe	-1.155	0.0072	-0.0083	-2.9715	4.8730	0.266	-4.342	0.3484
South Europe	-1.06	0.0124	-0.0131	-2.8765	5.3327	0.188	-5.638	0.3813
East Europe	-0.701	0.0174	-0.0122	-2.5175	7.4640	0.178	-3.938	0.5337
Other Europe	-0.674	0.0099	-0.0067	-2.4905	7.6527	0.225	-2.996	0.5472
W Central Asia & Middle East	0.204	0.0071	0.0014	-1.6125	16.6241	0.211	0.967	1.1887
South Asia	-0.582	0.014	-0.0081	-2.3985	8.3287	0.214	-2.720	0.5955
E & SE Asia	-0.36	0.0439	-0.0158	-2.1765	10.1880	0.12	-3.000	0.7285
Africa	-0.106	0.0035	-0.0004	-1.9225	12.7583	0.371	-0.286	0.9123
C & S America, Carib & Berm	-1.553	0.0094	-0.0146	-3.3695	3.3262	0.386	-4.023	0.2378
Other	-3.212	0.0006	-0.0019	-5.0285	0.6506	3.438	-0.934	0.0465
Highest level schooling								
SS or less	0	0.4378	0.0000	-2.6419	6.6491	0	0.000	1
Trades	0.33	0.0319	0.0105	-2.3119	9.0144	0.057	5.789	1.3557
Post secondary	0.886	0.3789	0.3357	-1.7559	14.7307	0.029	30.552	2.2154
University BA	2.468	0.1263	0.3117	-0.1739	45.6639	0.037	66.703	6.8677
University MA	3.414	0.0227	0.0775	0.7721	68.3979	0.059	57.864	10.2868
University PHD	3.765	0.0023	0.0087	1.1231	75.4567	0.183	20.574	11.3484

Table 5B (Continued)

Variables	Estimated coefficient β	Mean (share in the population)	β* Mean	Logistic	Likelihood in %	Standard error	Significance (T statistic)	Relative likelihood
Native-born highest level schooling								
SS or less	0	0.3748	0.0000	-2.5288	7.3863	0	0.000	1
Trades	0	0.0278	0.0000	-2.1988	9.9857	0	0.000	1
Post secondary	0	0.3273	0.0000	-1.6428	16.2083	0	0.000	1
University BA	0	0.1048	0.0000	-0.0608	48.4801	0	0.000	1
University MA	0	0.0164	0.0000	0.8852	70.7896	0	0.000	1
University PHD	0	0.0015	0.0000	1.2362	77.4900	0	0.000	1
North America highest level schooling								
SS or less	0	0.0014	0.0000	-2.8028	5.7172	0	0.000	0.7740
Trades	0.031	0.00005	0.0000	-2.4501	7.9429	1.157	0.027	0.7954
Post secondary	0.127	0.0026	0.0003	-1.7981	14.2079	0.313	0.406	0.8766
University BA	-0.16	0.0024	-0.0004	-0.5031	37.6806	0.306	-0.523	0.7772
University MA	-0.217	0.0009	-0.0002	0.3859	59.5288	0.348	-0.624	0.8409
University PhD	0.447	0.0002	0.0001	1.4009	80.2322	0.637	0.702	1.0354
North Europe highest level schooling								
SS or less	0	0.0055	0.0000	-2.5001	7.5849	0	0.000	1.0269
Trades	-0.1	0.0006	-0.0001	-2.2701	9.3627	0.322	-0.311	0.9376
Post secondary	-0.281	0.0065	-0.0018	-1.8951	13.0661	0.145	-1.938	0.8061
University BA	-0.31	0.0014	-0.0004	-0.3421	41.5292	0.189	-1.640	0.8566
University MA	-0.747	0.0004	-0.0003	0.1669	54.1621	0.304	-2.457	0.7651
University PhD	-2.743	0.00005	-0.0001	-1.4698	18.6971	0.792	-3.463	0.2413
West Europe highest level schooling								
SS or less	0	0.0039	0.0000	-3.6838	2.4511	0	0.000	0.3318
Trades	-0.017	0.0003	0.0000	-3.3708	3.3220	0.66	-0.026	0.3327
Post secondary	0.398	0.0025	0.0010	-2.3998	8.3187	0.297	1.340	0.5132
University BA	0.096	0.0003	0.0000	-1.1198	24.6046	0.39	0.246	0.5075
University MA	-0.092	0.0001	0.0000	-0.3618	41.0521	0.563	-0.163	0.5799
University PhD	1.151	0.00004	0.0000	1.2322	77.4201	1.144	1.006	0.9991

Table 5B (Continued)

Variables	Estimated coefficient β	Mean (share in the population)	β* Mean	Logistic	Likelihood in %	Standard error	Significance (T statistic)	Relative likelihood
South Europe highest level schooling								
SS or less	0	0.0086	0.0000	-3.5888	2.6888	0	0.000	0.3640
Trades	0.888	0.0003	0.0003	-2.3708	8.5426	0.519	1.711	0.8555
Post secondary	0.305	0.0021	0.0006	-2.3978	8.3340	0.243	1.255	0.5142
University BA	-0.575	0.0011	-0.0006	-1.6958	15.5013	0.253	-2.273	0.3197
University MA	-0.96	0.0003	-0.0003	-1.1348	24.3274	0.351	-2.735	0.3437
University PhD	0.387	0.00004	0.0000	0.5632	63.7190	0.88	0.440	0.8223
East Europe highest level schooling								
SS or less	0	0.0066	0.0000	-3.2298	3.8059	0	0.000	0.5153
Trades	-0.259	0.0007	-0.0002	-3.1588	4.0745	0.432	-0.600	0.4080
Post secondary	0.093	0.0068	0.0006	-2.2508	9.5279	0.183	0.508	0.5876
University BA	-0.52	0.0016	-0.0008	-1.2818	21.7242	0.211	-2.464	0.4481
University MA	-1.165	0.0014	-0.0016	-0.9808	27.2730	0.219	-5.320	0.3853
University PhD	-0.167	0.00016	0.0000	0.3682	59.1021	0.498	-0.335	0.7627
Other Europe highest level schooling								
SS or less	0	0.0039	0.0000	-3.2028	3.9060	0	0.000	0.5288
Trades	-3.7	0.0002	-0.0007	-6.5728	0.1396	3.467	-1.067	0.0140
Post secondary	-0.25	0.0031	-0.0008	-2.5668	7.1305	0.257	-0.973	0.4399
University BA	-0.901	0.0018	-0.0016	-1.6358	16.3036	0.252	-3.575	0.3363
University MA	-0.949	0.0007	-0.0007	-0.7378	32.3482	0.288	-3.295	0.4570
University PhD	0.915	0.00006	0.0001	1.4772	81.4147	1.1	0.832	1.0506
W Central Asia & Middle East highest level schooling								
SS or less	0	0.0027	0.0000	-2.3248	8.9089	0	0.000	1.2061
Trades	-0.415	0.0002	-0.0001	-2.4098	8.2427	0.667	-0.622	0.8255
Post secondary	-0.698	0.0025	-0.0017	-2.1368	10.5570	0.249	-2.803	0.6513
University BA	-1.14	0.0014	-0.0016	-0.9968	26.9568	0.245	-4.653	0.5560
University MA	-1.243	0.0003	-0.0004	-0.1538	46.1622	0.353	-3.521	0.6521
University PhD	4.105	0.00003	0.0001	5.5452	99.6109	9.881	0.415	1.2855

Table 5B (Continued)

Variables	Estimated coefficient β	Mean (share in the population)	β* Mean	Logistic	Likelihood in %	Standard error	Significance (T statistic)	Relative likelihood
South Asia highest level schooling								
SS or less	0	0.0056	0.0000	-3.1108	4.2663	0	0.000	0.5776
Trades	-0.091	0.0003	0.0000	-2.8718	5.3565	0.571	-0.159	0.5364
Post secondary	-0.178	0.0041	-0.0007	-2.4028	8.2958	0.235	-0.757	0.5118
University BA	-1.244	0.0033	-0.0041	-1.8868	13.1608	0.229	-5.432	0.2715
University MA	-1.454	0.0006	-0.0009	-1.1508	24.0341	0.307	-4.736	0.3395
University PhD	1.093	0.00006	0.0001	1.7472	85.1598	1.098	0.995	1.0990
East & South East Asia highest level schooling								
SS or less	0	0.0193	0.0000	-2.8888	5.2709	0	0.000	0.7136
Trades	0.026	0.0009	0.0000	-2.5328	7.3590	0.288	0.090	0.7369
Post secondary	-0.245	0.0158	-0.0039	-2.2478	9.5538	0.112	-2.188	0.5894
University BA	-0.904	0.0066	-0.0060	-1.3248	21.0019	0.12	-7.533	0.4332
University MA	-0.725	0.0011	-0.0008	-0.1998	45.0212	0.189	-3.836	0.6360
University PhD	0.145	0.0002	0.0000	1.0212	73.5204	0.517	0.280	0.9488
Africa highest level schooling								
SS or less	0	0.0012	0.0000	-2.6348	6.6931	0	0.000	0.9062
Trades	-4.388	0.0001	-0.0004	-6.6928	0.1238	4.419	-0.993	0.0124
Post secondary	-0.376	0.0014	-0.0005	-2.1248	10.6708	0.422	-0.891	0.6584
University BA	-0.968	0.0007	-0.0007	-1.1348	24.3274	0.422	-2.294	0.5018
University MA	-0.776	0.0001	-0.0001	0.0032	50.0797	0.586	-1.324	0.7074
University PhD	0.094	0.00002	0.0000	1.2242	77.2799	1.229	0.076	0.9973
C & S America, Caribbean & Bermuda highest level schooling								
SS or less	0	0.0041	0.0000	-4.0818	1.6597	0	0.000	0.2247
Trades	1.42	0.0004	0.0006	-2.3318	8.8522	0.58	2.448	0.8865
Post secondary	0.866	0.0039	0.0034	-2.3298	8.8684	0.4	2.165	0.5472
University BA	0.619	0.0008	0.0005	-0.9948	26.9962	0.427	1.450	0.5569
University MA	0.37	0.0002	0.0001	-0.2978	42.6092	0.537	0.689	0.6019
University PhD	0.802	0.00002	0.0000	0.4852	61.8972	1.265	0.634	0.7988

Table 5B (Continued)

Variables	Estimated coefficient β	Mean (share in the population)	β* Mean	Logistic	Likelihood in %	Standard error	Significance (T statistic)	Relative likelihood
Other highest level schooling								
SS or less	0	0.0002	0.0000	-5.7408	0.3202	0	0.000	0.0433
Trades	-0.885	0.00002	0.0000	-6.2958	0.1841	12.614	-0.070	0.0184
Post secondary	3.095	0.0003	0.0009	-1.7598	14.6814	3.463	0.894	0.9058
University BA	3.457	0.00008	0.0003	0.1842	54.5917	3.492	0.990	1.1261
University MA	3.189	0.00003	0.0001	0.8622	70.3117	3.634	0.878	0.9932
University PhD	NA	NA	NA	NA	NA	NA	0	NA
Major field of study								
Fine & applied arts	0	0.0358	0.0000	-2.2571	9.4738	0	0.000	1
Educ, rec & counselling	1.3	0.0729	0.0948	-0.9571	27.7458	0.044	29.545	2.9287
Humanities & related fields	0.469	0.0317	0.0149	-1.7881	14.3305	0.05	9.380	1.5126
Soc. science & related fields	0.497	0.0458	0.0228	-1.7601	14.6777	0.047	10.574	1.5493
Business & commerce	0.672	0.0399	0.0268	-1.5851	17.0073	0.048	14.000	1.7952
Financial management	-0.018	0.048	-0.0009	-2.2751	9.3206	0.051	-0.353	0.9838
Ind & institutional management & administration	0.363	0.0168	0.0061	-1.8941	13.0777	0.061	5.951	1.3804
Mkt, merch, retailing & sales	0.754	0.0065	0.0049	-1.5031	18.1962	0.082	9.195	1.9207
Secretarial science	-0.164	0.0394	-0.0065	-2.4211	8.1577	0.058	-2.828	0.8611
Agric & bio sciences/tech	1.614	0.042	0.0678	-0.6431	34.4544	0.046	35.087	3.6368
Engineering & applied sciences	0.715	0.0155	0.0111	-1.5421	17.6229	0.06	11.917	1.8602
Building technologies	0.679	0.0051	0.0035	-1.5781	17.1064	0.087	7.805	1.8056
Data proc. & computer sci/tech	0.791	0.0056	0.0044	-1.4661	18.7535	0.091	8.692	1.9795
Electronic & electrical tech	-0.018	0.2948	-0.0053	-2.2751	9.3206	0.048	-0.375	0.9838
Other engineering & applied sciences, technology & trades	0.157	0.0033	0.0005	-2.1001	10.9086	0.142	1.106	1.1515
Nursing	2.656	0.0212	0.0563	0.3989	59.8421	0.055	48.291	6.3166
Other health prof, sciences & technology	0.765	0.0227	0.0174	-1.4921	18.3606	0.056	13.661	1.9380
Math & physical sciences	1.001	0.0048	0.0048	-1.2561	22.1645	0.09	11.122	2.3396
All other	0.722	0.0004	0.0003	-1.5351	17.7248	0.306	2.359	1.8709
No post secondary	0.144	0.2479	0.0357	-2.1131	10.7829	0.049	2.939	1.1382

Table 5B (Continued)

Variables	Estimated coefficient β	Mean (share in the population)	β* Mean	Logistic	Likelihood in %	Standard error	Significance (T statistic)	Relative likelihood
All other CMAs & regions	0	0.6528	0.0000	-1.9340	12.6312	0	0.000	1
Montreal	-0.011	0.1342	-0.0015	-1.9450	12.5104	0.025	-0.440	0.9904
Toronto	0.218	0.1475	0.0322	-1.7160	15.2392	0.022	9.909	1.2065
Vancouver	0.084	0.0655	0.0055	-1.8500	13.5877	0.03	2.800	1.0757
Knowledge of official languages								
French only	0	0.1705	0.0000	-2.0186	11.7259	0	0.000	1
English only	0.099	0.6316	0.0625	-1.9196	12.7901	0.025	3.960	1.0908
Neither	-0.52	0.0132	-0.0069	-2.5386	7.3193	0.145	-3.586	0.6242
English & French	0.353	0.1847	0.0652	-1.6656	15.9005	0.026	13.577	1.3560
Age	0.167	40.078	6.6930	-1.8978	13.0360	0.008	20.875	1
Age squared	-0.002	1695.9046	-3.3918	-1.8978	13.0360	0.0001	-20.000	1
Period of immigration								
No year (native-born)	0	0.8526	0.0000	-1.8780	13.2613	0	0.000	1.0000
Prior to 1977	0.015	0.0525	0.0008	-1.8630	13.4348	0.235	0.064	1.0131
1978-1980	-0.109	0.0098	-0.0011	-1.9870	12.0570	0.209	-0.522	0.9092
1981-1983	-0.046	0.011	-0.0005	-1.9240	12.7411	0.187	-0.246	0.9608
1984-1986	-0.195	0.011	-0.0021	-2.0730	11.1744	0.161	-1.211	0.8426
1987-1989	-0.243	0.0189	-0.0046	-2.1210	10.7068	0.122	-1.992	0.8074
1990-1992	-0.314	0.0182	-0.0057	-2.1920	10.0467	0.109	-2.881	0.7576
1993-1996	-0.445	0.0146	-0.0065	-2.3230	8.9232	0.11	-4.045	0.6729
Legal marital status								
Single	0	0.1924	0.0000	-1.8645	13.4176	0	0.000	1.0000
Divorced	0.035	0.103	0.0036	-1.8295	13.8295	0.029	1.207	1.0307
Married	-0.045	0.6381	-0.0287	-1.9095	12.9034	0.02	-2.250	0.9617
Separated	-0.114	0.0419	-0.0048	-1.9785	12.1476	0.042	-2.714	0.9053
Widowed	-0.137	0.0246	-0.0034	-2.0015	11.9043	0.059	-2.322	0.8872

* This logistic regression is modeling the probability that a female individual is employed in skill level IV work and was estimated with 166,305 observations.
** Cox and Snell R Square: .228; Nagelkerke R Square: .362; Model Chi-Square: 42845.185 with 118 DF (p=0.000); percentage of correct predictions: 85.0%.
NA Not Applicable

Table 6B **Women: Results from logistic estimation of skill level III and IV occupations**

Variables	Estimated coefficient β	Mean (share in the population)	β* Mean	Logistic	Likelihood in %	Standard error	Significance (T statistic)	Relative likelihood
Intercept	-3.604	1	-3.6040	-0.4785	38.2606	0.126	-28.603	NA
Member of visible minority	-0.239	0.5572	-0.1332	-0.5843	35.7937	0.047	-5.085	0.8635
Not member of visible minority	0	0.4428	0.0000	-0.3453	41.4515	0	0	1
Census 1991	0	0.51	0.0000	-0.2222	44.4669	0	0	1
Census 1996	-0.523	0.49	-0.2563	-0.7452	32.1861	0.049	-10.673	0.7238
Years since migration	0.037	1.7062	0.0631	-0.4715	38.4253	0.014	2.643	1
Years since migration squared	-0.001	34.0989	-0.0341	-0.5085	37.5538	0.0001	-10.000	0.9773
Immigrant region of origin								
Native-born	0	0.8526	0.0000	-0.3406	41.5661	0	0.000	1
North America	-0.412	0.0076	-0.0031	-0.7526	32.0253	0.16	-2.575	0.7705
North Europe	-0.466	0.0144	-0.0067	-0.8066	30.8613	0.097	-4.804	0.7425
West Europe	-1.322	0.0072	-0.0095	-1.6626	15.9412	0.134	-9.866	0.3835
South Europe	-1.294	0.0124	-0.0160	-1.6346	16.3200	0.104	-12.442	0.3926
East Europe	-1.085	0.0174	-0.0189	-1.4256	19.3784	0.105	-10.333	0.4662
Other Europe	-1.197	0.0099	-0.0119	-1.5376	17.6883	0.132	-9.068	0.4255
W Central Asia & Middle East	-0.687	0.0071	-0.0049	-1.0276	26.3548	0.145	-4.738	0.6340
South Asia	-0.935	0.014	-0.0131	-1.2756	21.8298	0.118	-7.924	0.5252
E & SE Asia	-0.883	0.0439	-0.0388	-1.2236	22.7302	0.079	-11.177	0.5468
Africa	-0.773	0.0035	-0.0027	-1.1136	24.7198	0.229	-3.376	0.5947
C & S America, Carib & Berm	-1.288	0.0094	-0.0121	-1.6286	16.4021	0.155	-8.310	0.3946
Other	-0.355	0.0006	-0.0002	-0.6956	33.2786	0.404	-0.879	0.8006
Highest level schooling								
SS or less	0	0.4378	0.0000	-0.9958	26.9775	0	0.000	1
Trades	0.327	0.0319	0.0104	-0.6688	33.8773	0.037	8.838	1.2558
Post secondary	0.604	0.3789	0.2289	-0.3918	40.3292	0.019	31.789	1.4949
University BA	1.674	0.1263	0.2114	0.6782	66.3345	0.03	55.800	2.4589
University MA	2.669	0.0227	0.0606	1.6732	84.2007	0.068	39.250	3.1211
University PHD	2.593	0.0023	0.0060	1.5972	83.1631	0.21	12.348	3.0827

Table 6B (Continued)

Variables	Estimated coefficient β	Mean (share in the population)	β* Mean	Logistic	Likelihood in %	Standard error	Significance (T statistic)	Relative likelihood
Native-born highest level schooling								
SS or less	0	0.3748	0.0000	-0.8297	30.3713	0	0.000	1
Trades	0	0.0278	0.0000	-0.5027	37.6912	0	0.000	1
Post secondary	0	0.3273	0.0000	-0.2257	44.3819	0	0.000	1
University BA	0	0.1048	0.0000	0.8443	69.9375	0	0.000	1
University MA	0	0.0164	0.0000	1.8393	86.2869	0	0.000	1
University PHD	0	0.0015	0.0000	1.7633	85.3625	0	0.000	1
North America highest level schooling								
SS or less	0	0.0014	0.0000	-1.2417	22.4144	0	0.000	0.7380
Trades	-0.362	0.00005	0.0000	-1.2862	21.6497	0.768	-0.471	0.5744
Post secondary	-0.199	0.0026	-0.0005	-0.8462	30.0232	0.184	-1.082	0.6765
University BA	-0.232	0.0024	-0.0006	0.1908	54.7557	0.192	-1.208	0.7829
University MA	0.002	0.0009	0.0000	1.4198	80.5308	0.32	0.006	0.9333
University PhD	0.686	0.0002	0.0001	2.0278	88.3686	0.769	0.892	1.0352
North Europe highest level schooling								
SS or less	0	0.0055	0.0000	-1.3052	21.3292	0	0.000	0.7023
Trades	-0.523	0.0006	-0.0003	-1.5012	18.2247	0.235	-2.226	0.4835
Post secondary	0.033	0.0065	0.0002	-0.6682	33.8901	0.101	0.327	0.7636
University BA	-0.292	0.0014	-0.0004	0.0768	51.9192	0.173	-1.688	0.7424
University MA	-0.283	0.0004	-0.0001	1.0808	74.6646	0.375	-0.755	0.8653
University PhD	-1.712	0.00005	-0.0001	-0.4147	39.7791	0.782	-2.189	0.4660
West Europe highest level schooling								
SS or less	0	0.0039	0.0000	-2.1517	10.4175	0	0.000	0.3430
Trades	0.191	0.0003	0.0001	-1.6337	16.3327	0.344	0.555	0.4333
Post secondary	0.265	0.0025	0.0007	-1.2827	21.7095	0.163	1.626	0.4892
University BA	0.048	0.0003	0.0000	-0.4297	39.4203	0.314	0.153	0.5637
University MA	0.566	0.0001	0.0001	1.0833	74.7122	0.661	0.856	0.8659
University PhD	0.667	0.00004	0.0000	1.1083	75.1816	1.127	0.592	0.8807

Table 6B (Continued)

Variables	Estimated coefficient β	Mean (share in the population)	β* Mean	Logistic	Likelihood in %	Standard error	Significance (T statistic)	Relative likelihood
South Europe highest level schooling								
SS or less	0	0.0086	0.0000	-2.1237	10.6817	0	0.000	0.3517
Trades	0.314	0.0003	0.0001	-1.4827	18.5023	0.345	0.910	0.4909
Post secondary	0.146	0.0021	0.0003	-1.3737	20.2026	0.148	0.986	0.4552
University BA	-0.42	0.0011	-0.0005	-0.8697	29.5322	0.179	-2.346	0.4223
University MA	-0.983	0.0003	-0.0003	-0.4377	39.2295	0.311	-3.161	0.4546
University PhD	-0.1	0.00004	0.0000	0.3693	59.1295	0.87	-0.115	0.6927
East Europe highest level schooling								
SS or less	0	0.0066	0.0000	-1.9147	12.8456	0	0.000	0.4230
Trades	0.111	0.0007	0.0001	-1.4767	18.5930	0.222	0.500	0.4933
Post secondary	0.036	0.0068	0.0002	-1.2747	21.8458	0.109	0.330	0.4922
University BA	-0.499	0.0016	-0.0008	-0.7397	32.3075	0.155	-3.219	0.4619
University MA	-1.164	0.0014	-0.0016	-0.4097	39.8990	0.174	-6.690	0.4624
University PhD	0.154	0.00016	0.0000	0.8323	69.6846	0.554	0.278	0.8163
Other Europe highest level schooling								
SS or less	0	0.0039	0.0000	-2.0267	11.6430	0	0.000	0.3834
Trades	-0.424	0.0002	-0.0001	-2.1237	10.6817	0.444	-0.955	0.2834
Post secondary	0.147	0.0031	0.0005	-1.2757	21.8287	0.154	0.955	0.4918
University BA	-0.697	0.0018	-0.0013	-1.0497	25.9287	0.169	-4.124	0.3707
University MA	-0.936	0.0007	-0.0007	-0.2937	42.7104	0.231	-4.052	0.4950
University PhD	0.821	0.00006	0.0000	1.3873	80.0165	1.084	0.757	0.9374
W Central Asia & Middle East highest level schooling								
SS or less	0	0.0027	0.0000	-1.5167	17.9951	0	0.000	0.5925
Trades	0.225	0.0002	0.0000	-0.9647	27.5943	0.443	0.508	0.7321
Post secondary	0.056	0.0025	0.0001	-0.8567	29.8034	0.17	0.329	0.6715
University BA	-0.872	0.0014	-0.0012	-0.7147	32.8566	0.192	-4.542	0.4698
University MA	-1.027	0.0003	-0.0003	0.1253	53.1290	0.337	-3.047	0.6157
University PhD	1.994	0.00003	0.0001	3.0703	95.5652	3.636	0.548	1.1195

Table 6B (Continued)

Variables	Estimated coefficient β	Mean (share in the population)	β* Mean	Logistic	Likelihood in %	Standard error	Significance (T statistic)	Relative likelihood
South Asia highest level schooling								
SS or less	0	0.0056	0.0000	-1.7647	14.6206	0	0.000	0.4814
Trades	-0.071	0.0003	0.0000	-1.5087	18.1135	0.342	-0.208	0.4806
Post secondary	-0.316	0.0041	-0.0013	-1.4767	18.5930	0.137	-2.307	0.4189
University BA	-1.072	0.0033	-0.0035	-1.1627	23.8181	0.139	-7.712	0.3406
University MA	-1.771	0.0006	-0.0011	-0.8667	29.5946	0.244	-7.258	0.3430
University PhD	0.662	0.00006	0.0000	1.4903	81.6127	1.086	0.610	0.9561
East & South East Asia highest level schooling								
SS or less	0	0.0193	0.0000	-1.7127	15.2817	0	0.000	0.5032
Trades	-0.157	0.0009	-0.0001	-1.5427	17.6146	0.191	-0.822	0.4673
Post secondary	-0.125	0.0158	-0.0020	-1.2337	22.5539	0.07	-1.786	0.5082
University BA	-0.622	0.0066	-0.0041	-0.6607	34.0588	0.086	-7.233	0.4870
University MA	-0.746	0.0011	-0.0008	0.2103	55.2388	0.182	-4.099	0.6402
University PhD	1.097	0.0002	0.0002	1.9773	87.8396	0.764	1.436	1.0290
Africa highest level schooling								
SS or less	0	0.0012	0.0000	-1.6027	16.7608	0	0.000	0.5519
Trades	-0.863	0.0001	-0.0001	-2.1387	10.5394	0.604	-1.429	0.2796
Post secondary	-0.098	0.0014	-0.0001	-1.0967	25.0363	0.267	-0.367	0.5641
University BA	-0.788	0.0007	-0.0006	-0.7167	32.8125	0.295	-2.671	0.4692
University MA	-1.211	0.0001	-0.0001	-0.1447	46.3894	0.502	-2.412	0.5376
University PhD	-0.201	0.00002	0.0000	0.7893	68.7686	1.201	-0.167	0.8056
C & S America, Caribbean & Bermuda highest level schooling								
SS or less	0	0.0041	0.0000	-2.1177	10.7391	0	0.000	0.3536
Trades	0.148	0.0004	0.0001	-1.6427	16.2101	0.339	0.437	0.4301
Post secondary	0.276	0.0039	0.0011	-1.2377	22.4841	0.168	1.643	0.5066
University BA	-0.03	0.0008	0.0000	-0.4737	38.3746	0.232	-0.129	0.5487
University MA	-0.47	0.0002	-0.0001	0.0813	52.0320	0.411	-1.144	0.6030
University PhD	3.184	0.00002	0.0001	3.6593	97.4896	4.044	0.787	1.1421

Table 6B (Continued)

Variables	Estimated coefficient β	Mean (share in the population)	β* Mean	Logistic	Likelihood in %	Standard error	Significance (T statistic)	Relative likelihood
Other highest level schooling								
SS or less	0	0.0002	0.0000	-1.1847	23.4212	0	0.000	0.7712
Trades	1.164	0.00002	0.0000	0.3063	57.5988	1.3	0.895	1.5282
Post secondary	-0.33	0.0003	-0.0001	-0.9107	28.6861	0.523	-0.631	0.6463
University BA	-0.083	0.00008	0.0000	0.4063	60.0206	0.737	-0.113	0.8582
University MA	-0.653	0.00003	0.0000	0.8313	69.6635	1.23	-0.531	0.8073
University PhD	NA	NA	NA	NA	NA	NA	0	NA
Major field of study								
Fine & applied arts	0	0.0358	0.0000	-0.2868	42.8788	0	0.000	1
Educ, rec & counselling	0.259	0.0729	0.0189	-0.0278	49.3051	0.035	7.400	1.1499
Humanities & related fields	-0.132	0.0317	-0.0042	-0.4188	39.6804	0.042	-3.143	0.9254
Soc. science & related fields	-0.146	0.0458	-0.0067	-0.4328	39.3458	0.038	-3.842	0.9176
Business & commerce	0.058	0.0399	0.0023	-0.2288	44.3048	0.038	1.526	1.0333
Financial management	-0.057	0.048	-0.0027	-0.3438	41.4887	0.036	-1.583	0.9676
Ind & institutional management & administration	0.016	0.0168	0.0003	-0.2708	43.2711	0.049	0.327	1.0091
Mkt, merch, retailing & sales	0.278	0.0065	0.0018	-0.0088	49.7800	0.071	3.915	1.1609
Secretarial science	-0.067	0.0394	-0.0026	-0.3538	41.2461	0.037	-1.811	0.9619
Agric & bio sciences/tech	0.616	0.042	0.0259	0.3292	58.1565	0.038	16.211	1.3563
Engineering & applied sciences	0.541	0.0155	0.0084	0.2542	56.3210	0.053	10.208	1.3135
Building technologies	0.287	0.0051	0.0015	0.0002	50.0050	0.083	3.458	1.1662
Data proc. & computer sci/tech	-0.257	0.0056	-0.0014	-0.5438	36.7304	0.074	-3.473	0.8566
Electronic & electrical tech	-0.556	0.2948	-0.1639	-0.8428	30.0946	0.034	-16.353	0.7019
Other engineering & applied sciences, technology & trades	0.102	0.0033	0.0003	-0.1848	45.3931	0.092	1.109	1.0586
Nursing	1.291	0.0212	0.0274	1.0042	73.1884	0.05	25.820	1.7069
Other health prof, sciences & technology	0.353	0.0227	0.0080	0.0662	51.6544	0.044	8.023	1.2047
Math & physical sciences	0.547	0.0048	0.0026	0.2602	56.4686	0.088	6.216	1.3169
All other	-0.26	0.0004	-0.0001	-0.5468	36.6607	0.26	-1.000	0.8550
No post secondary	-0.433	0.2479	-0.1073	-0.7198	32.7437	0.034	-12.735	0.7636

Table 6B (Continued)

Variables	Estimated coefficient β	Mean (share in the population)	β* Mean	Logistic	Likelihood in %	Standard error	Significance (T statistic)	Relative likelihood
All other CMAs & regions	0	0.6528	0.0000	-0.5113	37.4878	0	0.000	1
Montreal	-0.019	0.1342	-0.0025	-0.5303	37.0436	0.019	-1.000	0.9882
Toronto	0.18	0.1475	0.0266	-0.3313	41.7913	0.017	10.588	1.1148
Vancouver	0.135	0.0655	0.0088	-0.3763	40.7009	0.023	5.870	1.0857
Knowledge of official languages								
French only	0	0.1705	0.0000	-0.6366	34.6021	0	0.000	1
English only	0.152	0.6316	0.0960	-0.4846	38.1172	0.017	8.941	1.1016
Neither	-0.293	0.0132	-0.0039	-0.9296	28.3011	0.079	-3.709	0.8179
English & French	0.357	0.1847	0.0659	-0.2796	43.0558	0.019	18.789	1.2443
Age	0.163	40.078	6.5327	-0.4785	38.2606	0.006	27.167	1
Age squared	-0.002	1695.9046	-3.3918	-0.4785	38.2606	0.0001	-20.000	1
Period of immigration								
No year (native-born)	0	0.8526	0.0000	-0.4821	38.1760	0	0.000	1.0000
Prior to 1977	0.165	0.0525	0.0087	-0.3171	42.1386	0.177	0.932	1.1038
1978-1980	0.081	0.0098	0.0008	-0.4011	40.1052	0.157	0.516	1.0505
1981-1983	0.079	0.011	0.0009	-0.4031	40.0571	0.142	0.556	1.0493
1984-1986	-0.049	0.011	-0.0005	-0.5311	37.0264	0.121	-0.405	0.9699
1987-1989	-0.036	0.0189	-0.0007	-0.5181	37.3300	0.092	-0.391	0.9778
1990-1992	-0.123	0.0182	-0.0022	-0.6051	35.3181	0.082	-1.500	0.9251
1993-1996	-0.225	0.0146	-0.0033	-0.7071	33.0243	0.083	-2.711	0.8651
Legal marital status								
Single	0	0.1924	0.0000	-0.4600	38.6982	0	0.000	1.0000
Divorced	0.014	0.103	0.0014	-0.4460	39.0308	0.022	0.636	1.0086
Married	-0.013	0.6381	-0.0083	-0.4730	38.3902	0.016	-0.813	0.9920
Separated	-0.169	0.0419	-0.0071	-0.6290	34.7733	0.031	-5.452	0.8986
Widowed	-0.185	0.0246	-0.0046	-0.6450	34.4113	0.042	-4.405	0.8892

* This logistic regression is modeling the probability that a female individual is employed in skill level III or IV work and was estimated with 166,305 observations.
** Cox and Snell R Square: .175; Nagelkerke R Square: .237; Model Chi-Square: 32028.503 with 118 DF (p=0.000); percentage of correct predictions: 70.1%.
NA Not Applicable

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